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SYNOPSIS

OF

MODERN PRACTICAL SURGERY,

BY

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LONDON.

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MODERN PRACTICAL SURGERY.

INFLAMMATION.

The principal symptoms of local inflammation, are redness, increased heat, pain, swelling, and interruptions or loss of function.

But each of these symptoms are not present in every case of inflammation; as in many instances only one or two of them are to be observed. Though inflammation of the internal, as well as the external parts, certainly are one or more of these symptoms invaribly present.

The degree, continuance, and effects, are not the same in every instance; as they are influenced and modified by various circumstances; but principally by the constitution of the patient, the cause of the imflammation, its extent, the organization of the part affected, its sensibility, and its importance in the animal economy.

Inflammation is divided into healthy and unhealthy, common and specific, acute and chronic.

Healthy is that which occurs in a constitution in which there exists no derangement of the health, either local or general, to effect or influence the inflammatory action.

Unhealthy is that which takes place in a debilitated constitution, or which has been caused, or its character

modified, by some previous local or constitutional disorder.

Specific is that which has been produced by the application of some irritating substance or poison, to the body, and which presents symptoms peculiar to itself.

Inflammation is said to be acute, when the local symptoms are violent, proceeding rapidly towards their termination, and exciting severe symptomatic fever and constitutional disorder, and chronic when the local symptoms are mild and tardy in their progress, and the constitution but little if at all affected.

Inflammation proceeds most favorably in those parts which are nearest the source of the circulation, and in those which are highly organized and vascular as a general rule.

The vital organs, though all very vascular, go through inflammation less favorably, because, during their derangement, the functions of general health are disturbed.

The redness of an inflamed part is occasioned by vessels which in health carry colorless fluid, being distended with red blood, together with the additional vessels, which are frequently formed in the coagulable lymph, and the change which the blood itself undergoes.

As animal heat is generated by the influence of the brain and nerves, by the decomposition of atmospheric air in the lungs, and by the changes which the blood undergoes in the course of its circulation through the body, it is supposed that increased heat must always succeed increased nervous and vascular action.

The increased heat is more perceptible in the external than internal parts of the body; especially in the palms of the hands, and soles of the feet.

The heat of an inflamed part is not really much increased above the standard of health, or at all propor-

tionate to the sensation of the patient; the heat even when the inflammation is situated internally, seldom exceeds the natural temperature of the blood, which is generally about 98° of Fahrenheit's thermometer.

The sensation of heat is most intolerable to a patient when the inflammatory action is severe, when the organ affected is possessed of great natural sensibility; and it is least felt in inflammation of those parts which are lubricated by the mucus fluids.

The pain attending inflammation arises chiefly from compression or distention of the nerves; it depends also, in some degree, upon the peculiar change which these organs suffer in consequence of increased vascular action.

The parts when under inflammation that are subject to the greatest pain, are those which have an abundant ramification of nerves, as the skin and eye; those whose texture is firm, as the bones and tendons; and hollow muscular viscera, as the stomach, intestines and bladder, which are continually contracting and dilating.

The cause of rigidity of structure rendering the pain more severe, is as follows. It has been observed that an effusion from the serous vessels of an inflamed part is always productive of an abatement of the increased vascular action, and preternatural sensibility; in parts, however, whose organization is unyielding and firm, no such effusion can take place; the congestion, therefore, of the vessels remains unrelieved, and the patient is longer before he experiences any diminution of pain.

The swelling which attends inflammation is produced by the increased quantity of red blood in the vessels of the inflamed part, by the effusion of serum and coagulable lymph and by the interrupted state of the process of absorption.

Inflammation is most violent at the point next the external surface of the body.

Symptomatic fever is that febrile state of the general system which is occasioned by severe or extensive local inflammation.

The symptoms of symptomatic fever frequently vary according to the constitution of the patient, and the kind of organ or part affected, but the ordinary ones are a quick, full and strong pulse, restlessness, hot dry skin, headache, flushed countenance, foul and parched tongue, thirst, nausea, loss of appetite, scanty and high colored urine, costiveness, and sometimes delirium.

Symptomatic fever is most likely to come on in inflammation of tendons, bones and ligaments, as we observe in a large joint when inflamed; in inflammation of very sensible parts, as the skin; in inflammation of vital organs, as the lungs; and in inflammation of parts which readily sympathize with the vital organs, as the testicle.

In inflammation of the great cavities, or their viscera, the constitutional and local symptoms always present themselves at the same time, but the local precede the constitutional in inflammation from external injury; and the constitutional the local in erysipelas and eruptive diseases.

The causes of inflammation are generally divided into remote and proximate.

The remote causes are divided into two classes, chemical and mechanical stimuli.

The chemical stimuli are cantharids, heat, strong acids, several gaseous substances, and animal poisons.

The mechanical stimuli are external injuries, as bruises and wounds.

The other causes of inflammation are fevers and colds.

The proximate cause of inflammation is a perverted action of the capillary vessels and a retardation of blood in them, and an excitement of the arteries running to the part.

The theory of inflammation is as follows, according to modern pathologists: — By the perverted action of the capillary vessels causing a retardation of their contents, the interruption produced is such, as to give rise to an increased energy of the arteries leading to this part; so that the blood is propelled through them with preternatural velocity; injecting vessels which in health carry colorless blood.

DIFFERENT TERMINATIONS OF INFLAMMATION.

Inflammation terminates in resolution, adhesion, suppuration, mortification, scirrhus, effusion and ulceration.

When *cellular* substances are inflamed, it terminates in resolution or suppuration; when mucous membranes, in suppuration or ulceration; of serous membranes, in resolution, adhesion or effusion; of muscles, in resolution or gelatinous effusion; of glandular parts, in resolution or scirrhus.

The termination of inflammation is influenced by its cause and degree, and the structure, situation and importance of the part affected.

The most favorable and common terminations of inflammation is by resolution and adhesion.

By resolution is implied a cessation of the inflammatory action, the diseased part returning to its natural state and function without the intervention of any of the other terminations of inflammation.

The theory of spontaneous resolution is by there taking place an effusion of serum and filvin into the cel-

lular substance, by which the morbidly increased vascular action is diminished, and at length completely checked.

The remedies of inflammation are divided into general and local.

The general are venesection, purgatives, diaphoretics, and low diet.

The local are the removal of the exciting cause, local bleeding, cold applications, rubefacients, warm fomentations and poultices, and in certain circumstances astringents.

The first circumstance to be attended to in the treatment of every inflammation, is to remove, if possible, or to moderate the operation of the exciting cause.

General blood-letting is useful, by diminishing the quantity of circulating fluid, the strength and frequency of the arterial pulsation is reduced, as well as the morbidly increased action of the whole sanguiferous system, and of the inflamed part in particular.

The circumstances which indicate the necessity of bleeding, are the youth, vigor and plethora of the patient, the inflammation being recent, severe or extensive; the part affected being a very sensible, delicate, or important one.

We should be cautious in the general abstraction of blood, when together with the inflammation, there exists disorder of the digestive organs; when the inflammation is purely local or not severe, when it has existed some time, the patient is feeble or old; when the affected part has lost its tone, or is much indurated, yet free from pain, blood should in these cases be taken away very sparingly.

Bleeding is most successful when employed early in the disease, and when the blood is taken away rapidly and in great quantities at once.

The quantity of blood which should be taken away at a time must depend upon the organ affected, the violence of the inflammation, and the age and vigor of the patient.

If the inflammation be not subdued by the first bleeding, as indicated by a continuance of pain, the pulse remaining strong, quick, and hard, the crassamentum of the blood being firm, cupped and exhibiting the buffy coat — you must repeat bleeding.

The crassamentum is one of the component parts of the blood; it is solid, and consist of fibrina and red globules.

The other component part is called serum; it is fluid, and is composed of water, albumen, and several saline compounds.

The buffy coat of the blood is present when the coagulation of the blood is slow; the component parts of the crassamentum separate from each other, and the fibrina appears like a white crust covering the surface of the red globules, which sink to the bottom of the vessel in consequence of their greater specific gravity.

An interrupted state of the process of secretion, is the cause of an accumulation of fibrina in the blood.

The buffy coat indicates an accelerated motion of the blood, and suspended nutrition.

But it is not a certain mark of inflammation, for it is observed in the coagulated blood of pregnant females, in active hemorrhage; in certain very old and nervous people in whom no indications of inflammation exists; and is not seen if the inflammation be strictly local.

The peculiarity of the blood of patients laboring under inflammation are, that it coagulates very slow, its texture is remarkably firm, and the upper surface of the crassamentum is concave.

From large bleeding in the latter stages of inflammation, effusion or gangrene would ensue.

Purgatives are useful in inflammation, by causing the contents of the bowels to be more speedily evacuated, removing a source of much irritation, and by increasing the different secretions poured into the intestinal canal, they diminish the quantity of the fluids of the body, and thus reduce the inflammation and general excitement.

The best purges are the saline ones, because they not only empty the bowels, but likewise possess direct refrigerant powers, and increase the abdominal secretions more than any other cathartics.

Purgative medicines are indispensable in almost every kind of inflammation, but they are of greatest utility in those of the head, throat and abdomen.

Clysters are necessary in some inflammations within the abdomen, when the mildest purgatives cannot be safely given, when those are vomited, or when their opeation is tardy.

Diaphoretics are beneficial in inflammatory affections, by causing the blood to flow from the internal parts to the surface of the body, they effect an equal distribution of it, and prevent its undue or dangerous accumulation in any particular organ; and by increasing the secretion from the exhalants of the skin, they preserve it moist, at the same time lessen the mass of the circulating fluids, and by the nausea they generally occasion, greatly assist in lowering the pulse and febrile excitement.

Diaphoretics are not admissible in inflammation of the stomach and upper portion of the intestines.

The best diaphoretics are the tartrate of antimony, Dover's powder, and warm bath. Opium is a useful remedy in inflammation, also, particularly after the bleeding and purgatives, though some are at variance with this remedy, I am aware.

The diet in inflammation should be low; diluent drinks and rest are always to be prescribed; stimulating liquors and animal food must be rigidly abstained from, even after the inflammation appears to have subsided.

In topical bleeding, the blood should be taken away as near to the inflamed part, and as freely and rapidly from it as possible, and as frequently as necessary.

Cold operates in reducing inflammation by diminishing the temperature of the part, tranquillizing the inordinate action of the neighboring arteries, and lessening the pain and preternatural sensibility.

It is best applied by keeping cloths moistened with cold liquids continually applied to the inflamed part, and to those in its immediate vicinity. The best cold applications are cold water, ice, vinegar, spirits of wine, solutions of plumb acet, &c.

Alcohol and ether prove beneficial in inflammation; in consequence of their extremely rapid evaporation speedily reducing the increased temperature, and consequently diminishing the irritability and pain of inflamed parts.

These are best employed when the inflammation has been moderated by previous depletion, or when it is attended with an extravasation of the fluids, causing considerable intumescence of the part.

The preparations of lead have, by some, been considered as dangerous applications, from the supposition that they may become absorbed and produce the disease

called colica pictonum ; but the most observant surgeons have never witnessed any bad effects to arise from such applications to inflamed surfaces.

Warm applications should be resorted to in inflammations occurring in very irritable constitutions; in those which are very violent, in those likely to terminate in, or which cannot be cured without suppuration ; in those of glandular and firmly organized parts ; in those also which are deeply-seated, or which exist in any of the viscera of the abdomen.

The best criterion by which you determine whether to use cold or warm applications, is the feelings of the patient, as bad effects are sometimes produced by applying cold to inflamed glandular parts ; even scirrhus is sometimes the consequence of such treatment.

Blisters and rubefacients subdue inflammation in this manner — by the pain they occasion they diminish the morbid sensibility, and by producing an afflux of blood to the part to which they are applied, they lessen the quantity sent to the seat of the inflammation and thus tend to remove the disease.

In the application of blisters attention should be paid never to apply them to the parts actually inflamed, nor while the local inflammation or its attendant constitutional affections continue very severe.

Astringents are to be had recourse to when the inflammation is very slight, or when it has become chronic.

CHRONIC INFLAMMATION.

This is characterized by an indurated circumscribed swelling of the part, accompanied with little or no pain, slight augmentation of temperature, no redness, and seldom if ever any fever.

Chronic inflammation is most frequently observed in those whose constitution is enfeebled and relaxed, and in those who are somewhat advanced in life.

Its most frequent termination is in chronic abscess.

The general remedies, to be used in chronic inflammation are gentle aperients, country air, moderate exercise, light nutricious diet, tonic medicines, as preparations of iron, &c.; the local ones are friction, blisters and caustic issues.

ADHESION.

By adhesion is understood as when the lungs adhere to the plura costalis, the intestines to the peritonæum, or when the opposite sides of a wound grow together without any suppuration taking place; such parts are said to be united by adhesion or adhesive inflammation.

Now this is produced by the vessels of the opposite inflamed surfaces discharging a serous fluid, the thinner parts of which the absorbents remove, but leave the albuminous, into which the smaller arteries extend themselves, and convert it into an organized substance by which an intimate connexion is established between the separated parts.

Adhesive inflammation most readily takes place in serous membranes and cellular substance. To favor the process of adhesion; we should remove all extraneous bodies, as blood, pieces of cloth, bone, &c., from between the separated parts, which we must keep in a relaxed and easy posture and preserve in close contact either by bandage, adhesive plaster or sutures.

The process of adhesion is impeded by an unhealthy state of the constitution, as well as by the presence of foreign bodies, excessive inflammation and the effects of mercury upon the system.

Parts though completely severed from the body will most assuredly reunite if replaced before their vital principle is extinct.

SUPPURATION.

When during inflammation there is produced in the part in which it exists a bland cream-colored fluid called pus, suppuration is said to have taken place. The structures most liable to suppuration are the mucus and cellular.

Suppuration may be induced without ulceration; we observe it for instance, in the mucus membrane, which lines the fauces and urethra—in catarrh, and gonorrhœa, and upon those parts of the skin to which perpetual blisters have been applied.

The theory of the ancients relating to suppuration tended to show that pus was formed by a solution of the living solids, but the moderns have ascertained that it is a fluid derived from the blood by the action of the vessels of the inflamed part, somewhat similar to secretion.

Some authors have imagined that a certain kind of puriform matter can be produced without previous inflammation; others again assert that no suppuration whatever, can take place without some degree of inflammatory action preceding it.

Pus when healthy is a thick yellowish colored fluid, heavier than water, and consisting of globules, suspended in a fluid, which becomes coagulated in a solution of muriate of ammonia.

When the constitution or the surface from which the matter is discharged is in an unhealthy condition, the pus becomes thinner, of a darker appearance, offensive, more irritating, having a greater disposition to putrefaction, and tinging black silver instruments besmeared with it.

When suppuration comes on, the throbbing acute pain with which the part was first affected is diminished and at length changes into one of a dull heavy kind ; the tumour has a white pointed spot on its middle part, there is an evident fluctuation within it, and if the suppuration be extensive, or in any important viscus the patient is attacked with rigors more or less violent.

ABSCESS.

If suppuration occurs within the textures of the body ; the consequence is a collection of the pus within a circumscribed cavity which we call an abscess.

The sac of the abscess is formed of organized lymph, which is thicker or thinner in proportion to the duration of the inflammatory action ; and is furnished both with absorbing and secreting vessels.

Abscesses are divided into acute and chronic.

When parts are likely to terminate in suppuration, the process may be hastened and considerable ease afforded by the application of warm fomentations and poultices.

In acute or phlegmonous abscesses the emollient poul-

tices should be frequently renewed. If the abscess be small, situated superficially or at a distance from important parts, it should be allowed to burst of itself.

Poultices have no power in accelerating the suppurative process, but they allay pain, diminish inflammation and keep the parts moist and easy. It is necessary to open acute abscesses, when they are large, or are situated within the cranium, abdomen, thorax or a joint; or in parts where the matter is likely to escape into these cavities, or to spread over a large extent of surface; as in the fore part of the neck, in the axilla, or near the rectum; or when they are deep seated, under the periosteum, muscles, ligamentous or tendinous expansions.

The part at which an abscess should be opened is at its most depending point, where it can be safely or readily done; where it cannot in consequence of great thickness of parts between the matter and skin, at its most prominent or pointed part.

If the pointing be at the upper part of the abscess the best surgical writers recommend the abscess to open spontaneously, and the orifice to be afterwards dilated by art, as much as necessity may require.

Abscesses are either opened by incision or caustic, the former of which is generally preferred.

When a considerable portion of the skin has been much distended and its structure destroyed by the magnitude of the abscess, and when there is any induration of the part, the latter mode should be adopted.

If the abscess has burst spontaneously a poultice should be applied to it, if it has been opened by a lancet a piece of oiled lint must be inserted between the lips of the wound and a poultice laid over all.

CHRONIC ABSCESS.

As the formation of chronic abscess is seldom or never attended with any apparent disorder either of the part itself, or of the constitution, we are scarcely ever aware of its existence until it begins to approach the surface and to form an external tumour. The pus of chronic abscess is thin and serous and contains substances resembling curds.

The difference between an acute and chronic abscess is, in the *acute* being quickly formed, its process rapid, and its being the consequence of acute and healthy inflammation; — the *chronic* abscess is slow in its formation, tardy in its progress, and the result of chronic or unhealthy inflammation.

All chronic abscesses should be opened as soon as their existence is ascertained; the opening into them should be small, oblique, and made by a lancet; after the matter is evacuated, the incision should be healed by the first intention.

A chronic abscess should be punctured near its base, or at a distance from the part where the matter threatens to be discharged spontaneously; because as it is a principal object to prevent the ingress of the air into chronic abscesses, which always irritates and inflames their cyst, the puncture should be made at the part of the tumour in which adhesion of the lips of the wound may be insured as speedily as possible.

Before the matter has accumulated in any considerable quantity the sac should be opened a second time, and the pus allowed to escape; and this operation should be repeated again and again until the disease is re-

moved; the obliteration of sac is accelerated by compress and bandage.

Blisters, issues, and electricity are the means recommended to disperse chronic abscesses.

Chronic abscesses are more dangerous than acute, because whether opened by art or allowed to burst spontaneously, their cavity always inflames, which circumstance is generally followed by dreadful and sometimes fatal disorder of the constitution.

ULCERATION,

Is that process of the animal function by which there is a breach of continuity produced in some part of the body, attended with want of due balance between the action of the absorbents and arteries of the part. On the walls of the chasm there is secreted a fluid from the minute termination of the arteries, varying in quantity and quality.

Ulcers are characterized by their surface being more or less irregular, evincing a tardiness to heal, the edges of the skin studded by a number of small pits, being often ragged, and overlapping the face of the sore.

But these appearances will be much modified by the character of the disease, its stage, and the structure in which it occurs.

Every part possessing physical and vital properties peculiar to it itself, renders some parts more susceptible to this process than others, whether from local or constitutional causes.

Ulcers may be divided into simple and specific; the former being those which take place in a sound constitution and are independent of any specific cause; frequently the effects of some injury sustained, as from pressure, or other sources of irritation of a part, influenced by the situation in which it occurs, the distance it is from the source of circulation, together with the age of the individual. Specific ulcers are those which arise from a specific poison and may be either limited to a particular part or make their appearance in any; these may also occur from predisposing cases of the constitution, as in secondary syphillis, scrophulous and scorbutic diarthesis.

Ulcers have been classed into six species.

1st. Those occurring in parts which have sufficient strength to carry on the action necessary for their recovery.

2d. Ulcers in parts which are too weak for that purpose.

3d. Ulcers in parts whose actions are too violent to form healthy granulations, whether this arises from the state of the part, or of the constitution.

4th. Ulcers in parts whose actions are too indolent, whether proceeding from local or constitutional causes.

5th. Ulcers whose parts have acquired some specific action, either from a diseased state locally or of the constitution.

6th. Ulcers which are prevented from healing by a varicose state of the superficial veins.

In the first species the wound has a general flushed appearance, the granulations which are shooting up from the cavity, are florid, small and pointed topped, and when

on a level with the skin are soon covered by a thin film, which expands from it, being the rudiments of the cuticle.

The *applications* should be of the mildest character; merely with a view of protecting nature in her energies towards reparation; as a little simple ointment, which will retain the pus in a fluid state, over the granulations; a bandage may be worn, and the limb kept in a horizontal position as much as possible.

In the second species the granulations are less firm in texture, sprouting up with large heads, and when on a level with the lips of the wound, are not so readily covered with a film, but continue to raise themselves above its margin, if not obstructed by pressure; though luxuriant as these granulations are, they are so weakly that from the most trivial cause they become altogether absorbed.

The state of the general health should be improved by tonics, nutritious diet and wine, and the granulations of the wound checked by caustic as soon as they advance above the level of the cuticle—strapping of adhesive plaster may be applied and a roller.

The third species or the irritable ulcer is marked by the unevenness of the chasm, its pale appearance, evincing little inclination to shoot up granulations, the ragged appearance of the edges, and the thinness of the discharge.

In the *treatment* our aim should be to remove the irritability, local and constitutional, by soothing measures. The wound may have warm fomentations or poultices containing opium applied, vapor baths, or ointments containing lead or opium; where the ulcer is extensive, and there is a tendency to gangrene the application of lint wet with a lotion of diluted nitric acid ʒ i to a quart of water will be highly beneficial.

The fourth kind of ulcer differs in character from the

preceding, the cavity being more even, the granulations glassy, the edges of the wound being very smooth and rounded, and the discharges from it thin. If the granulations be formed, succeeded by the completion of cicatrization, at a time when the constitution is not sufficiently invigorated, there is a great liability to their reabsorption when the wound is thrown open again.

This kind of ulcer generally occurs in debilitated constitutions, people at the advance of life, soldiers and sailors whose health has been impaired by drinking or great fatigue.

Applications of a stimulating character are generally of most service in these cases, if unattended with much irritation; as by the sore being touched occasionally with argent nitrat, and an ointment of hyd. nit. oxyd rub, smeared over a piece of lint, sufficiently small to lay within the lips of the wound; strapping of plaster should be carried round the limb; sometimes the ulcer may be healed by drawing its lips together with the latter only, being favored by rest. If the sore be extensive and particularly if of a fetid character, much benefit will be derived from nitric acid lotion.

The state of the health must have due attention in the course of treatment.

The fifth species are principally those ulcers depending upon diseased action of the constitution; though in some instances this morbid action is solely local and may be removed by a variety of applications, as by arsenic, hemlock, mercury, &c.

The sixth species is an indolent sore, which is liable to occur in the neighborhood of the saphena veins when they are in a varicose state.

The cure may generally be effected by a bandage; if

not, it is sometimes requisite to pass a ligature round the vein, which should be done where the vessel passes over the knee joint.

MORTIFICATION.

When any part of the body loses a great portion of its vital principle it is said to be mortified or gangrenous. Mortification is divided into two kinds, one the consequence of violently excited vascular action, accompanied at the same time with loss of power; the other preceded by little or no inflammation, or the consequences of a diminished supply of blood to, or its interrupted return from a part.

The first which is denominated acute or humid, occur in the young and vigorous; the second which is called dry or chronic, in the aged, weak and intemperate.

The difference between the terms sphacelus and gangrene is that sphacelus is used to express the complete death of any part; and the word gangrene the partial death. Parts sphacelated cannot recover; parts gangrenous may be restored.

The symptoms of gangrene are that the pain after being increased suffers a sudden diminution, the part affected is deprived in a great measure of its natural heat, sensibility and firmness, becomes soft, acquires a deep red or livid color and is generally covered with vesications filled with serous fluid.

When a part is sphacelated it is black, cold, motionless and insensible, and emits a fetid odor.

The symptoms of gangrene arising from impeded circulation are, that the part is affected with no pain, increased heat or any symptoms of inflammation ; but it is at first pale, cold and relaxed, it then becomes black, insensible and at length perfectly destroyed.

The constitutional symptoms of mortification are restlessness and dejection of spirits ; the countenance is pale, and there is an indescribable mildness and anxiety in the looks, the pulse is weak and rapid, the breathing hurried, accompanied with cold perspirations, hiccough and delirium.

Mildew mortification is that which is occasioned by eating unsound rye or other deleterious food. The disease commences in the hands and feet, which at first are painful and uneasy, particularly at nights, but afterwards become numb, cold and insensible ; at length the mortification spreads upwards, the parts affected lose all their moisture, grow black, are without fetor and drop off spontaneously. Mildew mortification renders the mind imbecile and more frequently attacks males than females.

In dry gangrene the part is withered, cold, hard and perfectly dry ; sometimes it retains the natural color of the skin, sometimes it is livid ; it gives out no offensive smell, and separates spontaneously from the living parts.

Inflammation of the skin and cellular substance, the stomach and intestines, are the parts most susceptible of being followed by gangrene, and the arteries resist mortification the longest.

The causes of mortification are commonly divided into two classes ; the first are the constitutional or internal, as certain unknown states of the system, poisonous and acrid substances taken into the stomach : the second are

external or local, as violent contusions, excessive inflammation, cold, fire, &c.

We may prognosticate favorably when the cause of the mortification can be removed, when it is not accompanied with emphysema, when the patient's constitution is healthy, when he is not far advanced in life, when the constitutional symptoms are moderate, and when the line of separation appears to form between the dead and living parts.

The acute mortification is to be treated in the first stage, by bleeding, purgatives, diaphoretics, and low diet; in the second stage, nourishing diet, cordials, wine, bark, opium and mineral acids should be administered.

We may bleed freely in gangrene, if the patient be strong, young and healthy; but should do it cautiously, if he be old, or the mortification be spreading.

Bark is seldom or never useful in gangrene arising from external causes, or in dry gangrene, and is often injurious if exhibited when the abdominal viscera are much disordered. Opium is often prescribed with great benefit in both stages of mortification; in the first conjoined with diaphoretics; in the second with bark, cordial, &c.

The external applications in modification may be, saturnine lotions, fermenting poultices, and mild ointment. The parts which are detached and loose must be removed.

Stimulating dressings are improper, except in chronic gangrene, malignant carbuncle, &c.

When gangrene arises from pressure, there must be fermenting poultices and solutions of opium applied, and the position of the patient frequently changed.

The general remedies in mildew mortification, are free

doses of opium and a generous diet; the local ones are mild emollient poultices.

Dry gangrene at its commencement, when no inflammation is present, should be treated by topical stimulants and nutritious diet; but in its confirmed stages it is incurable.

In gangrene, produced from internal causes, amputation should never be performed until the line of separation is seen betwixt the living and the dead parts; but in that arising from external causes, it may be undertaken without waiting for this change.

No hemorrhage follows the separation of mortified parts from the body; the reason of which is, the arteries leading to gangrenous parts are impervious, in consequence of adhesion of their internal surface, and the blood within them is coagulated for some distance; so that in amputation of a mortified limb, no tourniquet is necessary; even although the living parts be completely divided with the knife.

WOUNDS.

Surgical writers have divided wounds into incised, lacerated and contused, punctured, poisoned, and gunshot.

Besides the above there is another arrangement, which divides them into those of the head, throat, thorax and abdomen.

Hemorrhage is the immediate consequence and danger of every kind of wound; which cæteris paribus is more profuse in incised than in contused wounds.

Incised wounds, generally speaking, may be considered the least dangerous.

INCISED WOUNDS.

These wounds are caused by any sharp cutting instrument, as a sword, razor, &c., and are not attended with any contusion or laceration of the parts.

The indication first to be fulfilled in a case of incised wound, is to put a stop to hemorrhage.

Traumatic hemorrhage is to be checked by the tourniquet, by compression, by the ligature, by astringents, or the actual cautery.

We distinguish arterial from venous hemorrhage in the following manner: blood issues from a wounded artery very rapidly, in jets, and is of a bright vermilion color, while it flows from a vein in a smooth uninterrupted stream, and presents a dark purple appearance.

Wounds of the arteries are for the most part more dangerous than those of the veins.

Surgical means are not always necessary for suppressing hemorrhage; as when the injured vessels are not above a certain size, they spontaneously cease to bleed.

When an artery is divided it immediately discharges its blood, retracts within its sheath, becoming at the same time contracted at its truncated extremity; the blood is extravasated into the cellular substance that connects the artery to its inclosing sheath, which is left rough and lacerated upon its internal surface, where the blood readily forms a coagulum that plugs up the mouth of the vessel. When the artery is divided at a distance from any lateral branch, but not otherwise, a clot of blood of a conical form is found within the caliber of the artery

itself; this has been called the internal coagulum; its base is opposed to the one above mentioned, which is named the external coagulum.

Other circumstances happen to insure the permanent suppression of hemorrhage: the cut extremity of the artery inflames, coagulable lymph is poured out from its serous coat, which becoming organized, permanently unites the two sides of the cavity of the vessel together, and thus renders its channel completely impervious.

When an artery is partially divided the blood is effused between the artery and its sheath, for several inches both above and below the wound; after a short time it coagulates, and being firmly pressed down by the superjacent parts upon the puncture in the vessel, soon stops the hemorrhage.

The actual cautery may be applied in those cases of hemorrhage which occur within the mouth, and sometimes in those arising from fungous tumours which styptics or compression fail to suppress.

Astringents may be applied in those cases of hemorrhage which arise from slight superficial wounds, and in those arising from a number of small invisible arteries, and in those from diseased surfaces, when the vessels have lost their tone and contractile power.

The principal astringents are alcohol, the mineral acids, alum, agaric, &c.

Compression may be used in wounds of the veins; also when the bleeding is from many small arteries, and not from any particular one; when it is from a vessel running immediately over a bone; when it arises from vessels situated too deeply for the convenient application of the ligature, as those behind the angle of the jaw, the plantar, the palmar and the alveolar arteries.

If an artery has been punctured a tourniquet should immediately be applied round the limb to arrest the current of blood; the external wound must then be closed, and a graduated compress firmly bound by a bandage over the site of the opening in the artery.

In some cases it is requisite to take a piece of sponge, dipped in bees' wax and stiffened, and push it down upon the bleeding vessels; upon this you lay compresses of lint, and then bind the whole down by a roller.

The tourniquet should be had recourse to in all considerable hemorrhages from the arteries of the extremities; it is a very simple and effectual though only a temporary means of suppressing them.

Ligatures are demanded when the hemorrhage proceeds from a large artery.

The manner of applying them is this: when the wounded vessel is very large it must be seized by the forceps, when of a moderate size by the tenaculum, and pulled out or raised a little from its connexions; the ligature is then to be put round it, and tied on a firm knot, care being taken not to include a nerve, vein, or much flesh; one half of the ligature is then to be cut off, while the other is left hanging from the wound.

Some surgeons have recommended that both of the ligatures should be removed; others of equal skill have greatly reprobated it.

The effect that a ligature has upon an artery is, by its compressing its sides, and dividing its muscular coat and serous coat, causes its cavity to inflame and at length to be permanently obliterated. Round, small, and firm ligatures are to be preferred; their size of course varying a little with the artery to be tied.

The ligature from moderate sized arteries generally

comes away on the seventh day; from large ones on the twelfth or fourteenth.

When the hemorrhage in incised wounds is stopped, the next step to be taken is to remove all extraneous matter, as coagulated blood, pieces of glass, sand, &c., from the wound; then relax the muscles, and preserve the parts in an easy position, and lastly, keep the lips of the wound in accurate contact by bandages, plasters, sutures, &c.

Bandages are necessary in deep incised wounds, and can seldom be done without, even in very superficial ones; but they should never be applied too tight, nor when inflammation is present.

Sutures are proper when the parts cannot be preserved in contact without them, in incised wounds of old people, and in those of the face and abdomen.

They are seldom necessary and frequently injurious in young, vigorous, or irritable people, and very improper and dangerous when there is much inflammation about the wound.

When sutures create inflammation, they should be cut out, the bandages removed, and then warm fomentations and poultices applied.

In cases of incised wounds, the patient must be kept cool, free from anxiety or exertion, and desired to live very abstemiously. If he be strong, and sympathetic fever run high, he must be bled and briskly purged.

When incised wounds are deep or extensive, attended with much fever or inflammation, when a large or important artery, vein, or nerve, excretory duct, the brain, any of the thorax or abdominal viscera, the trachea or æsophagus have been injured, the prognosis will be less favorable than when they are not complicated with any of these.

LACERATED AND CONTUSED WOUNDS.

These are attended with little or no bleeding, seldom heal without suppurating, particularly if attended with much contusion, and are often followed by very violent inflammation.

The treatment of lacerated wounds should be to restrain the hemorrhage, if there happen to be any, remove all foreign matter, as splintered bones, &c.; then closely approximate all the parts you can, and keep them in their situation by plasters and position, endeavoring to unite them by the first intention; give opium to relieve the pain; reduce inflammation, if moderate, by cold lotions; if severe, by warm fomentations and emollient poultices, and a steady perseverance in every antiphlogistic measure.

The treatment of contused wounds should be — to preserve the parts in an easy position, and large emollient poultices frequently applied to them; if fever and inflammation supervene, they must be checked by antiphlogistic means.

Ecchymosed blood may be removed first by leeches, cold lotions, afterwards by friction and stimulating embrocations; if it be under the periosteum it is sometimes necessary to let it out by puncturing the membrane.

In contusion of the head, thorax or abdomen, an artery or vein, or some of the vicera may be burst.

Contused wounds are the most dangerous, because they frequently mortify and slough, whereas lacerated wounds will often heal by the first intention.

When the structure of the parts is so much destroyed as to be incapable of being restored, amputation may be necessary, though the operation should not be resorted to

until the patient has recovered from the shock, still before symptoms of fever and inflammation have appeared.

PUNCTURED WOUNDS.

These are wounds made by pointed instruments; they seem to partake more of the nature of lacerated than incised wounds, and are very dangerous when tetanous or violent and extensive inflammation of the fascia is occasioned by them, which not unfrequently happens.

The first measure to be taken is to stop the hemorrhage, then carefully remove all foreign bodies, prevent fever by rest, low diet, and aperient medicines, and reduce the local inflammation by leeches, cold evaporating lotions, or warm emollient poultices.

If spasmodic twitches be observed, and the constitutional symptoms become severe, the patient ought to be largely bled, freely purged, have low diet, and take antimonials; the inflamed fascia at the same time being completely divided by a transverse incision.

GUN-SHOT WOUNDS.

When a musket or cannon ball has entered or passed through a part of the body, it feels benumbed, the internal surface of the wound gangrenes and sloughs before it can heal; the circumference of its aperture is of a yellowish or livid color; there is little bleeding or pain, unless a large artery or nerve be torn across, and the patient is on the receipt of the injury not unfrequently attacked with shiverings, syncope, and violent symptomatic affections.

The injuries generally produced by gunshot, are con-

tusions, the ball not penetrating the surface, but bruising the interior parts, either shattering the bones, bursting viscera or blood-vessels, and causing extensive ecchymosis; a ball may carry off a limb or part of the body entirely; it may pass completely through, or it may enter and remain lodged in the substance of a part.

To distinguish the opening at which the ball entered from the one at which it passed out, we must notice that with the former the aperture is small, and its edges are depressed; the latter is larger, less contused, and more irregular, and its edges are elevated.

The two openings are not always opposite each other, sometimes balls take very circuitous routes; a shot has been known, when the arm was raised, to enter about the middle of the humerus, pass along the limb, over the dorsal aspect of the thorax, course among the abdominal muscles, pierce the glutæi, and present at the rotular aspect of the thigh.

The substances most frequently found in gunshot wounds, are the ball itself, pieces of clothing, and spiculæ of bone.

When fleshy parts are shot through, unaccompanied with wounded artery, viscus joint, or shattered bone, we should first remove, either with the fingers or forceps, all foreign bodies which are loose or superficial; we then apply to the lips of the wound a piece of oiled lint, and over this cloths constantly wetted with cold water; after a few days the application of a warm poultice is necessary, to promote the separation of the sloughs.

Incisions are never to be made into gunshot wounds, except for the purpose of tying an artery, or of extracting the ball, when this is not very deeply situated. When splinters of bone, angular shot, or other sharp irritating

bodies, are lodged in the wound, we must carefully cut them out; if a ball be firmly fixed in the soft part, it of course should be extracted as speedily as possible, but with as little irritation as the case can demand, if it press on some important viscus, artery or vein; if it do not, allow it to remain until loosened by suppuration, and then remove it.

In case a ball be lodged in a bone, some eminent surgeons recommend it to be extracted without delay, either by the trephine elevator or bullet drawer; while others recommend it to be left alone, unless it can be removed with certainty, and by very gentle means.

When a shot has passed about the situation of a large artery, a tourniquet should be loosely applied round the limb, and tightened in case of hemorrhage, when the artery should be tied.

Amputation should be performed when a joint is much shattered or laid open; when the soft parts are violently contused and deeply lacerated; when the principal blood-vessels or nerves, with much soft parts, are carried away, the bone remaining entire; when the hand or foot is cruelly torn; when a limb is shot completely off; when there is fracture of the bone, accompanied with wound of the principal artery; when the bone is shattered, and the soft parts destroyed; when the bone is smashed, the vessels ruptured, and the muscles crushed and torn, but without any external wound; when the parts fall into gangrene, and when hectic fever, and profuse or unhealthy suppuration, are wasting the patient.

Amputation should not be deferred, if even gangrene be spreading; it is only in gangrene arising from an internal cause, that we wait for the line of separation betwixt the living and dead parts; but in traumatic gangrene,

we do not defer the operation, but separate the limb just above the mortified part, which should be done as soon as the patient has recovered from the violence of the shock.

Where a musket-shot has merely penetrated a joint or shattered a bone, without in either case doing any very violent injury to the soft parts, you may endeavor to save the limb.

In the former example, inflammation should be subdued by frequent bleedings, by purgatives, low diet, rest, warm fomentations and poultices, and by other antiphlogistic means. When suppuration is established, nourishing diet, bark wine, mineral acids, &c., should be given, and opiates to procure rest. In the second example, the case should be treated as a bad compound fracture; lay the limb on splints, make an incision on the bone; keep down all inflammation and febrile excitement, by a diligent perseverance in antiphlogistic measures.

Gunshot wounds of the head are invariably attended with great danger, whether the ball enters the cranium or not. For if the skull be violently struck, the bone is either merely fractured, or the fracture is accompanied with depression or it is killed by the contusion, in which case the dura mater and pericranium separate from it, and then follow inflammation and abscess of the brain. If the ball enters, it fractures and drives in the bones, and either lodges in the brain or passes entirely through it.

All those means should be used as ward off and diminish inflammation and fever, and by having recourse to the trephine, when compression of the brain or other circumstances call for it.

Gunshot wounds of the abdomen are divided into two kinds; in the first, the ball enters the cavity of the abdomen, but does not injure the viscera; in the second, which is the most dangerous, the ball not only penetrates the parietes of the abdomen, but wounds the contained bowels.

Wounds of the abdomen are less dangerous when inflicted by sharp instruments than by gunshot.

For gunshot wounds of the abdomen, we must practise copious, general and local bleeding, give gentle purgatives and oleaginous clysters, apply fomentations and warm bath, and enjoin rest and rigid abstinence, extract all extraneous bodies that are within reach, return any protruded viscus, place on the wound the simplest dressings and emollient poultices, and if the bladder be wounded, we introduce along the urethra an elastic gum catheter, to prevent effusion of urine.

In gunshot wounds of the chest, inflammation of course must be subdued by copious abstraction of blood, and repeat it frequently, or as often as the pain and cough, difficult respiration and hemorrhage, returns; remove all foreign substances that do not require much searching for; close the external wound immediately, and open it again, or make another more suitable, if extravasation of blood within the chest, or any other causes require it; apply oiled lint and poultices to the wound, then give digitalis and antimonials, and if the cough be very troublesome, opiates; prescribing, at the same time, rest and low diet.

Punctured wounds of the chest are more dangerous than gunshot, because there is a greater discharge of blood, which being poured into the chest, oppresses the lungs, fills the bronchiæ, and threatens suffocation.

The ball sometimes passes completely through the lungs, or sticks in their substance; sometimes it enters the chest, sweeps round the lungs without touching them, and passes out opposite to where it entered, and sometimes it runs between the pleura and muscles.

BURNS.

Lesions of the body may be produced by heated substances coming in contact with it, either in a solid or fluid form; when in the latter, the injury thus sustained is termed a scald.

The importance of these will depend upon their extent, the causes from which they proceed, the part injured, as well as the individual in which they occur; if it be an extensive burn, it is no uncommon circumstance for death to ensue shortly afterwards, particularly in irritable constitutions, from the shock upon the nervous system, resembling that which succeeds concussion of the brain.

On the contrary, the injury may be so superficial as merely to destroy a portion of the cuticle; in that case the cutis below is irritated, and from the increased action of its capillaries, serum is effused between it and the cuticle, as though from the effects of lyttæ.

Were the cutis below these vessels destroyed by the heat, it could not perform this function, hence the absence of these blisters is some criterion of the depth of the burn.

When the injury has extended through the cutis, and its vitality thus destroyed, its surface will exhibit a dark mottled appearance, with a blanched border of demarcation, between the vital and dead parts.

If the case goes on well, in a few days the vital cutis will commence detaching the burnt from it, in which the process of decomposition is commencing.

When this eschar or burnt portion becomes detached, there remains a wound more or less deep, according to the extent to which the destructive effects of the fire has proceeded, which soon fills by granulations shooting up around its surface.

As the severity of the injury depends upon the degree of heat in the material, and the duration of its application, scalds differ generally in their character; fluids being less capable of carrying caloric than solids, their effects consequently not being so deep, though more frequently extensive, from the ready agitation of the former.

The danger of a burn or scald often arises from the system being deprived of the office allotted for the skin to perform in carrying on the functions of life, hence we observe the excessive oppression of breathing in severe cases.

It is no uncommon occurrence for inflammation of some internal organ to arise in cases of burns.

Mortification at the injured part may result from an excess of inflammation, or from an opposite cause, a sluggish circulation, general or local, or a want of due attention to obviate pressure on the sore.

The numerous modes of treatment in these injuries may be placed in two classes — those which are antiphlogistic in their tendency, and those which are stimulating; both of which are demanded, if judiciously applied in the cases to which they are adapted.

Shortly after the accident, if the burn be extensive, there is generally a state of collapse accompanying the patient's suffering, at which period, when the patient is placed in bed, cordials should be administered, and an

opiate, recollecting, under such circumstances, how much larger a dose is required to produce an anodyne effect.

The burnt surface should be covered with lint wet with a liniment of equal parts of liquor calcis and ol. lini, which should be renewed by means of a feather smeared over with it.

Some surgeons prefer a solution of chlorate of soda or the preparations of lead, others stimulants, as turpentine, spirits of wine, &c. &c.

The patient's bowels should be relieved, and the diet low, for a few days, and if any excess of fever or inflammation, their treatment should be followed up as usual, but reserving as much of the requisite energy for the reparative process as possible.

After three or four days, poultices are the best applications to the burnt part, to soften and detach the sloughs, and before, if mortification occur; and should this become alarming, it may be checked by obviating the cause, which may be as before mentioned the result of inflammation of the part, or too sluggish a circulation generally, or undue pressure upon the wound.

When the sloughs have come away, the wound should be dressed with some simple cerate, or occasionally, instead of it, lint applied wet with a solution of sulphate of zinc or chlorate of soda, which facilitates the cicatrization exceedingly.

If the injury be extensive, the system will require a free, nutritious diet, with wine, bark and acid, to complete the reparation.

During the process of cicatrization, care should be taken to prevent contraction of the integuments, by bandaging and attention to the patient's position, which unsightly results need rarely occur, even in the severest cases.

TETANUS.

This is an almost uninterrupted spasmodic contraction of the voluntary muscles.

It is produced by cold suddenly succeeding heat ; by ligatures twitching the nerves; by lacerated, punctured or gunshot wounds, and more particularly those of the extremities.

It generally appears about fourteen or twenty days after the accident.

Tetanus is divided into idiopathic, traumatic, acute, and chronic.

In traumatic tetanus, there is pain and inflammation of the wound, followed by rigidity of the muscles of the neck and lower jaw, extending to the back, and then to the arms, afterwards to the abdominal muscles, and lastly to those of the sacral extremities ; severe pain at the scrobiculus cordis, impeded respiration, small pulse, pale countenance, high colored urine, and constipated bowels.

When the disease affects only the lower jaw, it is called trismus.

Emprosthotonos is when the body is bent sternad ; opistholonous when it is bent dorsad, which is the most common form of tetanus ; and pleurosthotonos, when it is bent either dextral or sinistrad.

All irritating bodies are to be removed from the wound, and powerful opiate fomentations constantly applied to it ; in chronic or mild cases, before any inflammatory action has come on, the nerve may be divided above the wound, or the member amputated ; but either of these measures is useless in the acute or intense form

of the disease; opium must be frequently and largely administered, conjoined with calomel, the warm bath, and strong cathartics; bleeding, blisters and salivation, are recommended, and sometimes useful.

TIC-DOULOUREUX.

By this is understood a disordered state of a nerve, as if it had sustained some injury, though it is found to be unaccompanied with any change in its structure; the face is the part in which it usually occurs, and the branches of the fifth coming out of the infra-orbitar foramen, generally its seat, together with the net work of its communicating twigs; which indeed appear to afford a considerable auxiliary towards the characteristics of this disorder.

The symptoms are sudden attacks of excruciating pain, with spasmodic action of the muscles in the neighborhood; they are not continued, but occur in paroxysms.

These attacks are sometimes attributed to mental excitement, cold, or some disturbance of the general health; but their occurrence is more frequently unaccompanied with any apparent cause whatever.

We may discriminate tic-douloureux from rheumatism of the part, by the severity of the pain, its occurring in paroxysm, also by the absence of increased local heat.

The variety of measures recommended for the relief of this are such as tend but to enfeeble our faith of all, both local and general.

If there is any constitutional derangement from disordered action of the digestive organs, of course it must be relieved by measures adapted to the case.

The internal use of carbonate of iron, from half a drachm to a drachm twice a day, will in some cases of neuralgia be of considerable service, as may also the division or removal of a portion of the affected nerve; but we may sometimes see an individual bearing scars of the operation on his face, who is still a martyr to the disorder; a relief is sometimes afforded to the patient by its having entirely worn itself out.

AMPUTATION.

The causes for which amputation should be performed, are violent and extensive compound fractures of the thigh, particularly at the middle or proximal extremity, wounds accompanied with destruction of the main artery and nerve, and dreadful contusion and laceration of the soft parts; removal of a limb by cannon shot; mortification; various diseases of the bones; tumours, cancer, fungus, hœmatodes.

AMPUTATION OF THE THIGH.

The patient should be placed on a firmly fixed table, having his back supported by pillows and assistants, who are at the same time to secure his arms; the limb not operated upon is to be tied at the ankle to the table; a tourniquet must next be applied round the diseased limb, kept in a half-bent position; the leg is then to be held fast by an assistant, while the thigh is to be firmly grasped by another, who draws up the integuments; the operator standing on the dextral side of the patient makes as quickly as possible, with a large amputating knife having its edge directed obliquely proximad, an incision completely round

the limb, through the integuments and fascia, as far as the muscles; as soon as the skin is sufficiently retracted, he makes at its edge another incision through the superficial and loose muscles, first through those of the rotular aspect, then those on the popliteal; after allowing these to contract, he cuts through the deep and fixed ones down to the bone. All the soft parts are now to be drawn up by a linen retractor, close to which the periosteum must be cut by a circular incision, and the bone divided by a saw. After the limb is removed, the femoral, and any other large artery, must be seized by the forceps and tied; the tourniquet is now slackened, the bleeding arteries carefully sought for and secured; the skin and muscles are next brought forwards over the bone, and supported by plaster pledgets of lint, two cross bandages, and a third rolled round the limb from above downwards; after this the stump should be placed on a pillow, not too elevated.

The part at which the tourniquet should be applied, is as high up as circumstances will allow, in order that it may prevent as little as possible the free retraction of the divided muscles.

The part of the thigh at which we should always endeavor to amputate, should be as near the distal extremity as prudent.

The incision through the integuments, at whatever part of the thigh we amputate, should generally be made about three inches below the point at which we purpose to divide the bone.

The integuments require to be dissected back when they have become adherent in consequence of inflammation to the adjacent parts, or when they are in an unsound state, and cannot readily retract.

The integuments on the rotular or anterior aspect of the limb should be allowed to retract three-fourths of an inch; but those on its popliteal or posterior aspect only half an inch; because the muscles in the latter situation, during the healing of the wound, diminish and shrivel up more than those in the former one.

When there is a deficiency of soft parts to cover the bone, the surgeon should make the line of the wound perpendicular; when this is not the case he should make it transverse.

The dressings should be removed on the fifth or sixth day after the operation; the ligatures round the small arteries, if loose, should be gently drawn away on the sixth; but those round the large arteries not until the tenth or twelfth day.

The parts cut through in amputation of the thigh, are the common integuments, the fascia, and the following muscles: the sartorius, the rectus femoris, the vastus internus, the vastus externus, the cruræus, the gracilis, the triceps adductor magnus, the biceps flexor cruris, the semitendinosus and the semimembranosus, the cutaneous nerves, branch of the anterior crural nerve, the great sciatic nerve, the femoral artery and vein, and the vena saphena.

In case of pain, inflammation or swelling attacking the stump, the plasters, bandages, &c. should be removed, and warm fomentations and emollient poultices applied in their stead.

To suppress secondary hemorrhage, if it be venous, and produced by tight bandages, these must be loosened; if it proceed from a large artery, the dressings must be removed, and the vessel secured; if from a number of small arteries, it may be checked by washing

the stump with cold lotions. If secondary hemorrhage arise from a sloughing and unhealthy state of the stump, a piece of soft sponge should be kept constantly pressed against the surface of the wound, and the principal artery of the limb should also in some cases be cut down to and tied near the trunk. If these two measures prove unsuccessful, the surgeon should amputate at a higher point.

If the stump is attacked with spasm, it should be fixed to a pillow, and opium, in conjunction with gentle aperients, administered.

If the bone protrude from the surface of the stump, and it be large, it should be sawed off as close to the soft part as possible; but if the protrusion be not very considerable, the surgeon should allow nature to effect a cure by exfoliation.

The following is the mode of performing the flap operation: — The patient being placed and the limb fixed as in the other operation, the femoral artery should be compressed at the groin by a steady assistant; the operator then takes his position on the outer side of the thigh, and grasping its fleshy tibial or inner part, he pushes a catling from the anterior through to the posterior surface of the limb, close to the inner edge bone; he now cuts the instrument out obliquely, and forms a flap, about four inches long; as soon as he has secured the femoral artery, which is divided during this part of the operation, he enters and passes out the catling at the same points as before, and carrying it along the fibular side of the femur, he makes the outer flap corresponding in length and shape to the inner one; an assistant drawing aside the flaps, the operator places the edge of the knife at their very base, and divides the remaining

soft parts attached to the bone by a circular incision; then covering the face of the stump with a retractor, he saws the bone in two, securing the bleeding vessels, places the flaps in accurate contact, and retains them by plaster and bandage.

AMPUTATION AT THE HIP-JOINT.

The patient being laid on a firm table, with his nates hanging over its edge, and the limb held by an assistant while the femoral artery is compressed at the groin, the surgeon takes a long-bladed catling, and placing its point an inch below and somewhat on the mesial or inner side of the superior anterior spinous process of the ilium, he pushes it down to the head of the femur; then passing the instrument close to the outer side of the bone, he forces it onwards, and completely transfixes the limb; he now cuts fibulad or outwards for about an inch, to get round the trochanter major, which as soon as he has done he carries the catling obliquely downwards towards the knee, and separates the muscles from the outer side of the bone, so as to form a flap three or four inches in length; he now ties the femoral artery and likewise the profunda. Then entering and passing out the catling at the same points as before, he forms the inner and smaller flap by cutting the muscles at the upper and inner part of the thigh. The limb is now to be abducted, the capsular ligament laid open at its anterior and inner part, the head of the thigh bone dislocated, and the ligamentum teres divided. As soon as the limb is removed, the remaining blood-vessels must be tied, the flaps put in accurate apposition, and secured by plaster and bandage.

The muscles divided in making the outer flap, are the sartorius, the rectus femoris, the tensor vaginæ femoris, the three glutiæ, the obturator internus, the pryriformis, the gemini, and part of the vastus externus.

The muscles divided in forming the inner flap, are the iliacus internus, the psoas magnus, the obturator externus, the pectinal, the triceps adductor femoris, the biceps flexor cruris, the semitendinosus, the semimembranosus, and the gracilis, and quadratus femoris.

The femoral artery, and branches from the glutæal, ischiatic, and obdurator arteries; the femoral vein; sciatic and crural nerves, and branches of the obturator nerve, are divided.

AMPUTATION OF THE LEG.

A tourniquet being applied over the femoral artery just where it perforates the triceps muscle, and the patient and limb placed as in amputation of the thigh, a circular incision round the leg should be made through the skin and cellular substance, six inches below the petella. These parts are now to be dissected back, and drawn upwards for about two inches, especially at the fore part of the limb. The surgeon then applying the edge of his knife close to the base of the reflected integuments, and inclining it obliquely upwards towards the trunk, he cuts through the fascia and muscles quite down to the bone. The flap thus formed being held aside by an assistant, the interosseous ligament and parts attached to it should be divided by a catling; a retractor should then be put between the tibia and fibula, over the face of the stump, and the bones sawed across; the arteries are next to be secured, the tourniquet slackened, the soft parts brought over the bones, and the wound closed in a vertical direction.

The arteries requiring to be tied, are the anterior and posterior tibial, the fibular, and sometimes others.

The method of amputating the leg a little below the tuberosity of the tibia, is this: — The limb being properly supported by two assistants, and the tourniquet applied as in the other operation, the surgeon divides the integuments by a circular incision carried round the leg a short distance below the tuberosity of the tibia. He then dissects the integuments back for about two inches, and close to where the skin still adheres he divides the muscles quite down to the bones. This done, he cuts asunder by means of the catling, the soft parts between the tibia and fibula; then applying a retractor, he saws the bones in two just below the insertion of the ligament of the patella. As soon as the limb is removed, the fibula should be detached from its articulation with the tibia, the vessels tied, the nerves shortened, if necessary, and the bones covered by the soft parts.

The arteries requiring to be tied, are the anterior and posterior tibial.

The muscles cut through in amputating the leg just below the tuberosity of the tibia — those situated on the anterior part of the leg are the tibialis anticus, the extensor longus digitorum and peroneus longus; those on the posterior part are the gastrocnemius externus, the plantaris, the popliteus, the soleus, and the tibialis posticus.

In removing the leg by the flap operation, when the tourniquet is applied, the knee extended, and the limb steadily fixed by two assistants, the operator makes an incision through the integuments across the fore part of the leg, four inches in length; he then pushes a long-bladed catling close to the posterior surface of the tibia and fibula, from the inner to the outer extremity of this

incision; after having thus transfixed the lower part of the calf of the leg, he cuts downwards towards the heel, forming a flap from the gastrocnemii muscles three or four inches long. The flap being held back, he divides the remaining muscles and interosseous ligament; he then passes a retractor over the surface of the stump, and saws the bones in two exactly over the point where the catling was first introduced. The three principal arteries of the leg, and any large muscular ones, are now to be tied, the large crural nerve is to be dissected out, and the flap secured by sutures and bandage.

AMPUTATION OF PART OF THE FOOT.

When the tourniquet is applied round the thigh, and the patient's leg supported by an assistant, the surgeon lays hold of the foot with his left hand, and feeling the little eminences on the outer side of the os cuboides, and that on the inner side of the os naviculare, he carries an incision between these two points through the integuments across the instep, two inches before the ankle joint. He then makes a small longitudinal incision on each side of the foot, commencing at the extremity of the first incision, and extending backwards towards the heel. He now dissects back the integuments from the subjacent parts for about half an inch, and after dividing the ligaments between the astragalus and os naviculare, he bends the foot somewhat fibulad or outwards, and then cuts through those connecting the os calcis to the os cuboides. This done, he separates the muscles and other soft parts from the plantar or lower surface of the tarsal and metatarsal bones, and forms a flap long enough to cover the exposed articular surface of the astragalus and os calcis. The anterior tibial and two plantar arte-

ries are now to be tied, and the flap secured by plasters and bandage.

The parts divided in this operation, are the integuments, fascia and ligaments; the extensors and flexors of the toes; the tendons of the tibialis anticus and tibialis posticus; the peroneus longus; the peroneus brevis; the adductor and adductor pollicis, and the abductor minimi digiti muscles; the anterior tibial artery, vein and nerve; the two plantar arteries, veins and nerves, and the venæ saphenæ.

The manner of removing the metatarsal bones, when the tourniquet has been applied round the thigh and the leg, steadily supported by an assistant, is the operator commencing by dividing the integuments on the dorsum pedis by a transverse cut half an inch before the junction of the tarsal and metatarsal bones. From each extremity of this incision he continues a small longitudinal one forwards as far as the root of the toes. Then turning back the integuments, and dividing the ligaments connecting the tarsus and metatarsus, he cuts the soft parts forming the sole of the foot away from the bones. The metatarsus along with the toes now being removed, he saws off the projecting extremity of the inner os cuniforme, loosens the tourniquet, applies the flap to the surfaces of the bones, and secures it by plaster and bandage.

AMPUTATION AT THE SHOULDER-JOINT.

The patient being conveniently seated, the subclavian artery compressed by an assistant as it passes over the first rib, and the limb held horizontally, the operator makes a longitudinal incision on the anterior border of the deltoid muscle, and another on its posterior border. The lower extremities of these two incisions he then

connects by a transverse cut dividing the same muscle a little above its insertion.

The triangular flap thus formed, he now dissects up, and while it is reflected, he lowers the arm, lays open the capsular ligament, and divides the long head of the biceps; then carrying his knife in a circular direction along the ulnar or inner side of the limb, he cuts through the remaining muscles and soft parts in which lies the axillary artery. This large vessel is immediately to be secured, and afterwards the smaller branches. The flaps are then to be laid over the glenoid cavity of the scapula, and preserved in their proper situation by adhesive plaster.

The parts divided in this operation, are the deltoides, the biceps flexor cubiti, the supra-spinatus, the infra-spinatus, the teres minor, the subscapularis, the long head of the triceps, the coraco-brachialis, the teres major, the latissimus dorsi and the pectoralis major muscles; the axillary artery, with some of its branches; the axillary nerves and vein.

The method of removing the head of the humerus, when diseased or splintered by gunshot, is this:—The arm being fixed as in amputation at the shoulder-joint, the surgeon makes a longitudinal incision down to the bone, through the middle of the deltoid muscle, extending from the acromion process nearly throughout its whole length; then desiring an assistant to separate the lips of the wound, he lays open the capsular ligament, and divides the long head of the biceps, the tendons of the supra-spinatus and infra-spinatus, and those of the teres minor and subscapularis muscles. The head of the humerus is now to be elevated through the wound and sawed off, and if splintered, the fragments should be picked away. This done, the wound should be closed,

and end of the bone pushed upwards, and the arm secured to the side by a bandage and supported in a sling.

AMPUTATION OF THE UPPER ARM.

The patient being seated in a chair or laid on a table, with his arm extended at right angles with the trunk, and supported at each extremity by two assistants, a tourniquet is to be applied as near to the shoulder as possible; the integuments now being drawn upwards and made tense, the surgeon divides them by a circular incision round the arm; then dissecting the skin and cellular substance back for about two inches, he applies the edge of his knife close to the part where they still adhere, and making a second circular incision, he divides the superficial muscles; as soon as these are retracted, he cuts through the deep seated muscles and periosteum down to the bone; now applying a retractor to the surface of the stump, he saws the humerus in two, ties the arteries, and covers the bone with the soft parts, making the line of the wound transverse.

The parts cut in this operation, are the skin, the fascia, the biceps flexor cubiti, the triceps extensor cubiti, and the brachialis internus muscles; the brachial artery; the arteriæ profundæ superior and inferior; the vena basilica and the venæ comites; the musculo-cutaneous nerve; the radial, ulnar, spiral and internal cutaneous nerves.

AMPUTATION OF THE FORE ARM.

A tourniquet being applied round the arm a little above the condyles of the humerus, the fore arm should be supported at each extremity by two assistants, and fixed in a state between pronation and supination. The integuments now being drawn upwards towards the elbow, the

operator divides them by a circular incision carried round the limb, and after separating them from the subjacent parts, he turns them back for about two inches. He now places the edge of the knife at the base of the reflected skin, and cuts through the fascia and muscles down to the bones; then dividing the interosseous ligament and other soft parts between the radius and ulna, he applies a retractor, and turning the hand quite prone, he saws the two bones across. This done, he ties the arteries, lays down the muscles and skin, and secures them by plaster and bandage.

Four arteries require to be tied in this operation, the radial, the ulnar, and the two interosseal.

The mode of amputating the fore arm, with two flaps, is as follows: — A tourniquet being applied a little above the condyles of the humerus, and the fore arm held by two assistants, as in the previous operation, the surgeon introduces a catling at the inner and thenal edge of the ulna, and thrusts it close to the anterior surface of the bones, directly across the fore arm, until its point appears beyond the radial or outer side of the radius; he then cuts towards the wrist, forming a flap of nearly an inch in length, where the point of the catling emerging, he again introduces it, and pushing it along the anconal or posterior surface of the bones, through to the ulnar or inner side of the arm, he brings it out at the place where it was first entered; he now forms the posterior flap of the same length as the other; an assistant holding the two flaps aside, the surgeon cuts the soft parts between the radius and ulna; this being finished, he applies a retractor, turns the hand to its utmost state of pronation, and saws the bones across; he then secures the arteries, places the surfaces of the flaps in accurate apposition, and retains them by adhesive plaster and bandage.

The muscles on the anterior of the fore arm divided in this operation, are the supinator radii longus; the flexor carpi radialis; the palmaris longus; the flexor carpi ulnaris; the flexor digitorum sublimis perforatus; the flexor longus pollicis, and the flexor digitorum profundus perforans.

The muscles on the posterior part are the extensor carpi ulnaris; the extensor digitorum communis; the extensor carpi radialis longior; the extensor carpi radialis brevior; the indicator; the extensor secundi internodii pollicis; the extensor ossis metacarpi pollicis, and the lower part of the supinator radii brevis.

The other parts divided by this amputation, are the skin; the fascia; the radial, the ulnar and interosseous arteries and veins; the radial, the ulnar, the external and internal cutaneous nerves, and the superficial veins.

AMPUTATION AT THE WRIST.

A tourniquet being applied above the condyles of the humerus, and the fore arm held in a state between pronation and supination, the surgeon grasps the patient's hand and makes a circular incision through the integuments round the wrist, beginning an inch distad or below the styloid process of the radius; the integuments now being drawn upwards towards the elbow, he dissects them back for a short distance; he then divides the tendons and ligaments, proceeding from the radial through to the ulnar side of the joint; as soon as the hand is removed, he ties the arteries, and covers the exposed articular surfaces of the bones with the skin.

The arteries requiring to be tied in this operation, are the radial, the ulnar, and sometimes the interosseous.

AMPUTATING THE FINGERS.

The hand being turned prone, and steadily fixed by an assistant, the operator takes the finger in his left hand, and bending the joint, he places the heel of his knife on the back and lower extremity of the metacarpal bone; then lowering his hand, and drawing the instrument down until it is nearly perpendicular, he makes an incision half round the finger. He now cuts upwards towards the hand, separating the integuments from the bone. As soon as he has arrived at the joint, he divides its lateral ligament and enters the capsule; then carrying his knife round the head of the phalanx, he brings it out on the other side, opposite the place where he began his first incision, and thus forms two corresponding flaps. The finger being removed, the flaps are to be carefully laid down, and secured by plaster and bandage.

The method of removing the phalanges, is as follows. The hand being firmly fixed, a longitudinal incision a quarter of an inch in length should be made on each side of the finger, commencing at the joint to be removed; at the lower extremity of these incisions, a circular one is to be carried round the finger; the flaps are then to be reflected, the joint bent, and the capsular and lateral ligaments divided. If there be much hemorrhage, the arteries may be tied; if not, the two flaps of skin must be immediately applied to the end of the bone.

INJURIES OF THE HEAD.

The consequences of injuries done to the head, are ecchymosis; extravasation of blood under the aponeurosis of the occipito-frontalis muscle; wounds of the integu-

ments, producing inflammation, abscess, or erysipelas; concussion of the brain; fracture of the bones of the skull, with or without depression; inflammation or disease of the bones themselves, or the membranes attached to them; inflammation of the brain; effusion of blood within the cavity of the cranium.

If blood or pus be confined under the integuments of the cranium, and it is lodged in the cellular membrane, it is readily dispersed by means of pressure, cold applications and purgatives; if it lie deeper, as under the pericranium, and be in considerable quantity, occasion great pain, or seem likely to excite suppuration, it should be discharged by making an opening through the integuments; as soon as the existence of pus is known, it should be evacuated.

Bloody tumours of the scalp may be mistaken for depression of a portion of the cranium, in consequence of the softness of the centre and the hardness of their circumference.

In incised wounds of the scalp, the head must be shaved, the hemorrhage suppressed, all foreign bodies removed, the detached parts, whether integuments or bone, carefully laid down in their proper place, then secured by plaster and bandage; the patient at the same time must be kept cool and easy, and every other means prescribed to prevent or subdue inflammation and febrile excitement.

In lacerated wounds, after having shaved off the hair, stopped the hemorrhage, and removed all extraneous matter, we should carefully approximate the lips of the wound, however lacerated they may be, and secure them by plaster and loose bandage; at the same time we should reduce the fever and inflammation, by rest, abstinence, purgatives, cold applications, or warm poultices.

The cause of such great care being required to preserve every portion of injured scalp, is from the peripheral or outer table of the cranium deriving its blood from the integuments that cover it, which must die and exfoliate, if these be removed.

In cases of wounds that have been punctured, should be closed as soon as possible, and the local inflammation subdued by cold lotions, rest, low diet, and purgatives.

Punctures of the scalp are sometimes followed by inflammation of the fascia, and sometimes by erysipelas.

When the fascia of the head is inflamed, a transverse incision should be made through the inflamed fascia down to the bone, and then blood-letting, active purgatives, diaphoretics, rest, abstinence, and exclusion from light and noise, prescribed.

The symptoms of erysipelas are shiverings succeeded by flushes of heat, sleepiness, wandering pains, headache, thirst, dry tongue, nausea and oppression at the stomach; after this, there appears in the part affected a dark shining redness, vanishing on pressure, but speedily returning as soon as the pressure is removed, accompanied with acrid heat, pungent pain, and diffused swelling, upon the middle of which vesications arise about the fifth day, the fever at the same time increasing; on the ninth day the fever generally subsides, and the redness is changed to a yellowish color; when the face is attacked, it swells, the features are distorted, the eye closed up, and delirium supervenes.

The terminations of erysipelas are in resolution, a kind of suppuration, and gangrene.

Its causes are disorder of the digestive organs, improper diet, cold and intemperance; it is sometimes epidemic, sometimes contagious; when it attacks the face and scalp it is most dangerous.

The constitutional treatment of erysipelas is moderate bleeding, active purgatives, diaphoretics, and low diet; in milder cases, purgatives combined with or succeeded by tonics.

The local treatment is by warm fomentations of poppy heads, soothing poultices, scarifications, and powdered starch or calamine, to absorb the serous fluid; blisters have occasionally been found successful.

CONCUSSION OF THE BRAIN.

When the head or general frame has received a very violent shock, the brain sometimes becomes affected with peculiar symptoms, which are denominated concussion.

The symptoms in the first stage are marked by insensibility, difficult respiration, pallid face, slow, weak, intermitting pulse, and cold extremities; the second stage, by returning sensibility, by sickness, by the extremities becoming warmer, the pulse stronger and more regular, the face redder, and the respiration more free; the third stage is characterized by great febrile excitement, acute pain in the head, quick, hard pulse, intolerance of light and sound, contracted pupil, wildness of the looks, and generally delirium.

In the first stage gentle stimulants may be given, and warmth applied to the extremities; in the second stage we bleed, give active purgatives and diaphoretics, prescribe rigid abstinence and seclusion from light and sound, apply blisters to the nape of the neck, and use unremittingly cold applications to the head; in the third stage we shave the head, and have recourse to the same plan of treatment as that laid down for the second stage, but carried to a far greater extent.

FRACTURE OF THE CRANIUM.

The difference between the word fissure and fracture is, that in the former the breach is narrow or fine; in the latter it is open or wide; counter-fissure is fracture opposite the injured part.

The bones of the skull that are most frequently fractured are those situated on the coronal aspect; sometimes only one, sometimes both tables are broken, and the fracture in either case may be attended or not with depression.

Fracture of the skull is generally regarded as dangerous, but not on account of the mere breach of continuity in the bone, but because the blow that has caused it may have produced violent concussion, inflammation, rupture of the vessels, and consequent compression of the brain.

All those means which obviate inflammation are to be diligently used. The patient must be largely and repeatedly bled, both from the arm and temporal artery, and have leeches applied to various parts of the head; active purgatives and antimonials must be administered, and rest, rigorous abstinence, and exclusion from light and noise, strongly enforced; the scalp must be closely shaved, and cloths wetted in cold lotions constantly applied to it, and blisters to the nape of the neck.

If symptoms of compression appear, the trephine must be applied, first over the injured parts observable upon the scalp, and if relief be not obtained, then along the line of the fracture, or upon the sphœnoidal angle of the parietal bone.

Though the fractured bone be depressed, if there be no symptoms of compressed brain, we should not be warranted in trephining.

The trephine is used to enable us to raise depressed portions of the skull compressing the brain, or to take away spiculæ of bone irritating and inflaming this organ or its membranes, to evacuate purulent matter, extravasated blood or serum, and to remove foreign bodies or diseased pieces of the cranium.

The signs which distinguish compression of the brain are, if it be slight the patient vomits, if severe there is no vomiting; the limbs are relaxed, the pupil of the eye dilated and insensible to strong light, the breathing is stertorous, the pulse slow, the fœces and urine involuntarily discharged, paralysis, and sometimes convulsions.

The causes of compression are depressed parts of both plates of the cranium or detached fragments from its central table, extravasated blood, pus, and extraneous bodies.

The proximate cause of compression is obstructed circulation of blood in the brain, by which the nervous energy is diminished or destroyed.

The way in which we ascertain whether compression arises from depression of bone, extravasation of blood or purulent matter, is in the first case by the patient never regaining his senses after the infliction of the injury; when from the second, after having for a time recovered, he again gradually sinks into a state of unconsciousness and insensibility; the last is always preceded by symptoms of inflammation within the head, and is a long time before it produces its effects.

Compression from extravasated blood is the most dangerous, because it can less easily be removed than depressed bone, and owing to its diffusion it produces more extensive and serious mischief.

The parts within the cranium that blood is found

extravasated, is between the central surface of the skull and dura mater, between this membrane and the membrana arachnoidea, in the convolutions, ventricles, or in the substance of the brain.

The situation in which it is most frequently effused and least productive of injurious consequences, is between the bone and dura mater, whence it can be sometimes readily and effectually removed by the operation of the trephine.

Blood is more frequently poured out from a number of small vessels.

It is difficult, often impossible, to distinguish concussion from compression, because the symptoms of the one bear so great a similarity to those of the other, and they frequently both exist at the same time, or those of compression arise before the patient has at all recovered from the effects of concussion.

If the stupor and insensibility immediately following the shock disappear, and the patient a little time after again becomes confused, sick, drowsy, and at last insensible, it is evident that in this instance he must be suffering under compression. Some writers affirm that concussion may be known by the coldness of the extremities, by intermitting pulse, and absence of stertorous breathing, but these symptoms are very fallacious.

When the compression is slight, the symptoms frequently subside by bleeding, purgatives, antimonials, cold applications to the head, and other antiphlogistic measures; but in severe cases, in addition to every powerful depleting means, we have recourse to the trephine.

If there be no external wound or depressed bone, and yet symptoms of compression, some recommend, along with the antiphlogistic means, the trephine to be applied

over the middle artery of the dura mater ; others are opposed to this plan, and advise only the former.

The symptoms which indicate an inflamed or sloughy state of the membranes of the brain, produced by concussion, are these: — A few days after the accident the whole head becomes affected with pain, which seems to extend from the injured part, over which there shortly arises a circumscribed, puffy tumour ; the body is at the same time feeble and languid, and the appetite bad, the patient has great thirst, nausea, furred, dry tongue, disturbed sleep, hot skin, quick hard pulse, flushed countenance and inflamed eyes ; after these symptoms, violent rigors come on, and then follow delirium, vomiting, convulsions and coma.

We discover in the dissection of such tumours, pus or dark colored ichor, which is found separating the pericranium from the bone, which is of a gray or livid appearance, and when cut does not bleed ; pus is also seen lying upon the dura mater, which no longer adheres to the surface of the skull.

The febrile symptoms at the commencement of such a case are to be subdued by bleeding, purgatives, antimonials, cold applications to the head, blisters, rest and low diet, and as soon as the existence of matter is ascertained, it must be evacuated with the trephine.

The prognosis of wounds of the head is very difficult ; a slight blow will sometimes cause the death of the bone, separation of the pericranium and dura mater, and consequent inflammation and suppuration of the brain ; while from the severest injuries, in which even portions of the brain have been destroyed, patients not unfrequently recover.

OPERATION OF THE TREPHINE.

The parts over which it is not advisable to perform this operation, are over the frontal sinuses, the frontal spine, the longitudinal and lateral sinuses, over the sutures, the sphœnoidal angle of the parietal bones, and not lower than half an inch coronad the orbitar arches; yet in cases of emergency, the surgeon should not hesitate to perform the operation at any of these situations.

Owing to the irregularities of the os occipitis and the large muscles which cover it, it is difficult but not dangerous to perform the operation of trephine at this part of the head.

The operation is this:—The head being properly secured and shaved, an incision in the shape of the letter T, or as like it as the form of the external wound will allow, is to be made over the injured part completely through the integuments, which are to be dissected back from the bone. Any foreign bodies or loose splinters that may appear being now removed, the central pin of the trephine is to be fixed in, and its crown applied perpendicularly to the bone; the instrument is then to be moved backwards and forwards by the hand, and as soon as it has formed a groove sufficiently deep for containing the teeth without the aid of the central pin, the latter is to be withdrawn, lest it should perforate the skull and wound the brain; the depth of the groove must be occasionally ascertained by a probe, and the small pieces of bone cleared away; after the trephine has entered the diploe, which is known by the increased hemorrhage and soft feeling, and begins to approach the dura mater, it should be worked with great caution; and when the bone is nearly sawed through, it may be detached by the forceps

or raised by the levator, the projecting points being removed by the lenticular. As soon as the object of the operation is attained, the flaps are to be replaced as nearly as possible in their natural situation, and dressed with lint and simple ointment, over which a loose bandage may be applied.

To remove a depressed and firmly fixed portion of the skull, the trephine must be applied in such a situation on the sound cranium as will include a part of the depressed bone, and most readily loosen it.

If the depressed bone be not very firmly wedged in, we must endeavor to elevate it by the forceps or levator, but if these prove ineffectual, have recourse to the trephine, and apply it entirely on the sound cranium, but so that the line of depression be included in the circle of the trepan hole.

If the depressed bone cannot be raised by one perforation, the trephine should be again applied, and in such a situation as appears most suitable to disengage the bone.

The way to apply the trephine in cases of fracture without depression, or in those of abscess of the dura mater with carious bone, is in the first case in the line and widest part of the fracture; in the second, in the middle of the diseased portion of the cranium.

If blood be extravasated upon the peripheral surface of the dura mater, it separates the membrane from the bone, which when cut does not bleed very freely, owing to the central plate being deprived of a great part of its circulation.

To remove it from this situation, after the cranium is perforated a portion of the effused blood may be got away by the fingers, probe and injection of tepid water; part of what remains becomes thin by exposure to the

air and flows out, and the remainder is taken up by the absorbents.

To remove extravasated blood from beneath the dura mater, for in this case the membrane is elevated, tense, and of a dark color, we make an opening into it by a lancet to evacuate the blood, but from its wide diffusion only a small quantity, and that principally serum, can be brought away, and the patient generally dies.

If the middle meningeal artery, longitudinal or lateral sinuses, be wounded by the trephine, the hemorrhage may be checked by the application of lint to the wound.

In proceeding to trepan over the frontal sinuses, we should first remove by a large trephine the peripheral plate of the cranium, and then by a smaller one perforate the central plate.

The method to be pursued in performing the operation over the frontal ridge, or any other irregularities, is by the bone being first cut by the trephine as far as it is safe, and the rest divided by Hey's saw.

The patient, after the operation of trephining, must be bled and well purged, live abstemiously, and avoid every excitement, lest inflammation of the dura mater and brain supervene.

FUNGUS CEREBRI,

Is a protrusion of the brain and its membranes through a preternatural opening in the cranium. It is produced when there is a deficiency in the bones of the cranium, whether natural or occasioned by disease or injury of the trephine; the brain, by the strong pulsation of its arteries, is pushed through the opening, and elevated much above the surface of the skull.

Congenital encephalocele is of two descriptions; one is a soft, round and pulsating tumour, reducible by pressure, and covered by the integuments of the head; it generally appears at one of the fontanellæ where the bones of the head are not very completely ossified; the other is flaccid, of a reddish color, not covered by the scalp, and in some instances not even by the dura mater.

The symptoms of hernia cerebri arising from accident are, one kind composed of cerebral matter and coagulated blood of a darkish color, and covered by the pia mater, protrudes a few days after the accident through an ulcerated opening in the dura mater. The tumour enlarges as the internal hemorrhage which caused it continues, and soon bursts through the inflamed pia mater. Another kind, not appearing so soon as the first, is a completely organized fungus arising from some ulcer in the brain, and is always preceded by an opening in the dura mater. It is about the size of a pigeon's egg, but sometimes much larger, of a dark gray color, very vascular, and grows with great rapidity, often speedily springing up in a short time after it has been removed. Both species are generally accompanied with coma, and sometimes paralysis.

The cause of the first kind of fungus cerebri from accident, is internal hemorrhage from rupture of the blood vessels a little below the surface of the brain, by which this viscus is expanded and raised through the dura mater, and then through the aperture in the skull.

Encephalocele arising from deficient ossification of the cranium, when of the first description, may be cured by constant and moderate pressure; the second is incurable.

The treatment of that following injuries of the head is to evacuate the purulent matter, remove the tumour by excision and gentle pressure, and let the patient be bled, take aperients and live abstemiously.

FUNGOUS TUMOURS OF THE DURA MATER.

The existence of this dreadful disease is not known until it appears externally. It then presents a soft, yielding, elastic, pulsatory swelling, very firm at its base, suffering diminution when pressed on, and if the compression be forcible, causing stupefaction and convulsions.

The tumour is sometimes painful, but often it is attended with no pain; when not very large it can easily be returned within the cavity of the cranium, and the margin of the bones distinctly felt surrounding its sides.

These tumours are produced by chronic inflammation, being excited by some cause or other in the vessels of the dura mater which communicate with those of the diploe, a tumour arises which by its pressure destroys the two tables of the cranium, but particularly the centre one; when it has perforated the bone it raises up the scalp, and this, in consequence of the distention, soon ulcerates. If the tumour rapidly increase while yet within the skull, it occasions stupor, sickness, and all the symptoms of compressed brain, but these vanish in proportion as the aperture in the bones becomes widened.

The part of the dura mater in which these tumours are supposed to originate, is its peripheral layer, the central one and the pia mater being quite unconnected with the disease.

Tumours of the dura mater are to be considered always as dangerous; those which are most so have a broad

base, have been of long continuance, and have produced disease in the brain ; those which are least so, are those which are firm, movable, not painful, have a narrow base, and have not caused much disease in the surrounding parts. They may be mistaken for simple tumours of the scalp, aneurisms and herniæ cerebri.

The mode of treatment consists in making a crucial incision along the whole extent of the swelling, the flaps dissected back to its base, the edges of the bone to be removed by Hey's saw, and then the tumour, with part of the dura mater from which it springs, to be cut entirely away ; after the removal of the tumour, the patient must be treated as after the operation of the trephine.

It is not ever advisable to destroy fungous tumours of the dura mater by ligature or caustic, as the application of either is generally followed by inflammation of the brain and its membranes.

WOUNDS OF THE FACE.

The treatment will vary according to the kind of wound, but as it is a principal object here to prevent deformity, we must endeavor to heal as many of them as we are able by the first intention. In incised wounds we restrain the hemorrhage, remove foreign bodies and splintered bones, approximate the lips of the wound as accurately as possible, and secure them by plaster, sutures or bandage.

Sutures are most required in wounds of the eyelids, nose, lips and ears; if the nose or ear be cut off or bit-

ten, the part must be replaced, and kept in its proper situation by plaster and sutures.

The diseases which sometimes follow wounds of the eye-brows, are ptosis and lagopthalmos; and injury of the supra-orbitar nerve is not unfrequently succeeded by amaurosis.

The consequences of wounds of the parotid gland or duct, is salivary fistula, which is an opening on the cheek continually discharging saliva, but more profusely during mastication.

The treatment for this if the parotid duct be recently divided and the wound extend quite through the cheek, the sides of the opening must be placed in accurate contact, and kept closely pressed together by roller and compresses until they unite. In this case the peripheral side of the wound heals, the central side remains open, becomes callous, and affords to the saliva a passage into the mouth, or the divided extremities of the parotid duct reunite, and the saliva again flows along its original channel.

When the complaint has been of long continuance, it must be remedied by the introduction of a seton, which is effected in the following manner: — The surgeon putting his two fore fingers into the patient's mouth, raises the cheek from the gums, and then pushes through it a trocar, basilad and centrad; withdrawing the stilette, he passes a piece of thread through the canula into the mouth; he next removes the canula, and then affixes to the thread inside the mouth a skein of silk, which is to be drawn from within outwards, but not so far as to pass entirely through the wound, the thread alone being lodged between its peripheral lips, and the seton between its central. The external opening being closed by plaster and compresses except where the thread hangs out, the seton gradually made larger and larger

must be retained until it forms a callous opening through which the saliva may pass into the mouth. When the silk is removed, the little orifice left by the thread must be touched by caustic, which very soon causes it to cicatrize. During the employment of these measures, the patient ought to subsist on liquids, and refrain as much as possible from mastication.

There are the two following means also of curing salivary fistula: — If the saliva has some channel into the mouth, and the external fistulous orifice be small, the application of caustic will occasionally heal it; compresses and tight bandage constantly applied to the parotid gland of the diseased side, so as to cause its obliteration, have also cured the disease.

WOUNDS OF THE THROAT AND NECK.

The important parts liable to be injured in wounds of the neck, are the external jugular, and the carotid and thyroideal arteries and internal jugular veins, the par vagum, the recunent and intercostal nerves, the larynx, the trachea, the pharynx and œsophagus.

The external jugular vein commences near the angle of the lower jaw, runs down the neck between the platysma myoides and sterno-cleido mastoideus muscles, crosses obliquely over the latter, then passes along its dorsal edge and terminates in the subclavian vein, beneath the clavicle.

The carotid artery after having emerged from the chest, runs along the neck by the side of the trachea,

covered by the sterno-cleido-mastoidei muscles and nearly opposite the cornu of the os hyoides, each divides into an internal and external branch. At the sacral part of the neck they lie on the sternal aspect of the trachea, but as they approach the head they incline more towards its sides and a little previous to their division they rest upon the longi colli and recti capitis interni majoris muscles, being covered by the platysma myoides, glands and common integuments.

The internal jugular vein, the par vagum and intercostal nerves are all included in the same sheath with the carotid artery; the jugular vein runs on the sternal and lateral part of the artery; the par vagum on its lateral and dorsal part, and the intercostal nerve on the mesial side of the par vagum.

The situation of the larynx trachea and œsophagus is this; the larynx is attached to the sacral edge of the os hyoides and placed at the atlantal and sternal part of the neck; the trachea runs along the sternal aspect of the neck from the cricoide cartilage into the thorax, being covered sternad by the skin and cellular membrane and laterally by the sterno-hyoidei and sterno-thyroidei muscles; the œsophagus is situated between the trachea and cervical vertibræ and has the pharynx at its atlantal extremity.

Wounds of the external jugular veins are to have moderate and constant pressure applied to them; fatal hemorrhages have been known to arise from wounds of these veins. If there be a small wound of the internal jugular vein, attempts should be made to heal it by compress and bandage; if large the vessel must be secured by a ligature.

In the treatment of wounds of the carotid, if the sur-

geon arrives before the patient expires, which rarely happens, he must seize the vessel and tie it both above and below the wounded point, taking care not to include in the ligature the eighth pair of nerves.

The wound usually made in suicide is an incision generally high up in the neck between the os hyoides and thyroid cartilages, opening directly into the pharynx; the food and saliva escape at the wound and the patient is affected with a troublesome cough. The lingual and superior thyroideal arteries are commonly divided, but the trunk of the carotid in consequence of its being situated at this part of the neck, so far dorsad, is seldom injured.

The treatment of such a wound after the bleeding arteries are secured — the patient must be placed for a short time upon his belly to prevent the blood trickling down into the larynx and trachea; when the oozing has ceased he must be laid supine, the lips of the wound approximated and retained by sutures and plaster. His head must then be raised and his chin brought forwards towards the chest, in which position it must be preserved by the application of a bandage. In order that a patient's food may not escape at the wound and be received without his performing the act of swallowing, which would inevitably tear out the stitches and disturb the dressings, an elastic gum catheter ought to be passed through one of the nostrils and down the œsophagus, and aliment and medicines conveyed along it into the stomach. The patient must be kept quiet, and any inflammatory symptoms subdued by antiphlogistic means.

The symptoms produced by wounds of the larynx or trachea are hemorrhage, discharge of mucus and emission

of air from the wound, loss of speech, continual cough, difficulty of swallowing, and if the orifice be small or irregular, emphysema.

The hemorrhage must be checked and the lips of the wound brought into accurate contact by elevating the head and keeping the chin close upon the chest and secured by adhesive plaster, and if required by sutures. An elastic gum tube should likewise be introduced along the nose and œsophagus into the stomach, and all febrile or inflammatory symptoms checked by strict antiphlogistic means. If the troublesome cough appears to arise from inflammation it must be appeased by bleeding; if from other causes by demulcents and opiates.

Wounds of the larynx are more dangerous than those of the trachea, owing to its extreme sensibility, which renders it more liable to inflammation; longitudinal wounds of the wind-pipe are more readily healed than transverse.

Sutures are seldom or never requisite, except when the tube is completely divided, and then we employ broad flat ones, taking care not to introduce them through its lining membrane, lest by so doing we cause inflammation, and perhaps fatal consequences.

Emphysematous swellings are to be treated by puncturing the skin and by friction.

Wounds of the œsophagus, which are readily known by their depth, and by liquids as soon as swallowed instantly escaping from them; we first secure any vessels that may be bleeding; then close the external wound and introduce an elastic gum catheter down into the stomach: prescribe low diet and quietude, and prevent inflammation by the usual means. The trachea and œsophagus may both be cut at the same time — and instances have

been known without the carotid arteries or internal jugular veins being wounded; though indeed we should, from their situations, be induced to deny that such a circumstance could ever happen.

WOUNDS OF THE THORAX,

Are divided into the three following kinds: viz. those which affect the skin and muscles; those which penetrate the cavity of the thorax, but do not injure the viscera; and those which not only enter the cavity but injure some of the contained organs.

The treatment will vary according as they come under the class of incised, lacerated, or gunshot wounds.

The effects produced by wounds that penetrate the chest, are impeded respiration arising from compression of the lungs, being produced either by the entrance of the external air through the wound, or by infusion of blood from the intercostal or internal mammary arteries into the cavity of the thorax; protrusion of the lungs, emphysema and inflammation.

The best mode of stopping hemorrhage from the intercostal artery, is to take a piece of sponge to which a ligature is attached and introduce it between the two ribs so as firmly to compress the vessel; the bleeding may likewise be checked by cutting the artery across, and allowing it to retract into its sheath or by seizing it with a tenaculum and then securing it by a proper ligature.

The treatment to be pursued in protrusion of the lungs;

if the protruded part be in a healthy condition and uninjured, it should immediately be returned; after which the wound must be closed and secured by compress and bandage; when the opening is so small as to prevent the reduction it ought to be dilated; if the part be mortified or much contused, it must be cut off, a ligature being previously applied round its base, to guard against hemorrhage.

Emphysema is characterised by an elastic and crackling tumour, arising over the wound and soon extending to every part of the body; there is tightness and pain in the chest; the breathing is oppressed, particularly in the horizontal position; the face looks inflamed and the pulse is weak and irregular.

The kind of injury and wound which this affection succeeds, is fracture of the ribs, where the extremities of the bone have pierced and lacerated the lungs, and deep slanting punctured and gunshot wounds of the breast.

This is the way in which emphysema is produced: if the cells of the lungs be opened the air that entered them by the trachea during inspiration escapes from the wound and lodges in the chest between the pleura pulmonalis and pleura costalis; during expiration when the cavity of the thorax is diminished, this air is compressed, but as it cannot return through the aperture in the lungs it is forced into the breach in the pleura costalis, passes into the cellular membrane and causes emphysema.

The way in which emphysema is produced when there is no wound in the lungs, but only in the parietes of the chest is this: during inspiration, when the whole dimensions of the chest are increased and the external air is passing along the trachea to expand the lungs, it rushes

at the same time through the wound into the bag of the pleura and causes the lungs to collapse more or less; during expiration this air is pressed out from the thorax, but if the wound be not free, part of it gets into the cellular membrane and occasions emphysema.

The treatment in emphysema is to prevent the air from spreading; consequently we puncture the skin not only over the wounded part, but wherever the complaint has extended. If the symptoms continue unabated a small but free opening must be carefully made into the cavity of the thorax, and after the air has been evacuated by successive efforts of expiration, the aperture should be closed and a bandage applied round the chest; with these means we conjoin friction and repeated venesection.

The symptoms of extravasated blood are the patient's complaining of great oppression, restlessness, a sense of weight on the diaphragm, difficulty of laying on the back and pain behind the sternum when placed upon the side opposite the wound; feels easier when his body is bent forward or laid on the wounded side; his respiration is difficult, his pulse weak, his countenance pale and ghastly, and his extremities cold.

Extravasation may arise from the intercostal arteries or from the lungs at the same time; but when from the latter there is bloody expectoration, very frothy, and florid blood is discharged at the external wound, and air escapes from it with a hissing noise.

To relieve the symptoms of extravasation after bleeding has been employed, the patient should be placed on the wounded side that the blood may run out at the aperture; if this be too small it must be dilated; and if at the atlantal part of the chest another ought to be made, between the sixth and seventh ribs: when the blood is coagulated,

it must be broken down by the injection of warm water. The symptoms of inflammation of the lungs are obtuse and often wandering pains, a frequent soft pulse, difficulty of breathing, particularly in the recumbent position, tumid face, and cough usually moist; when the pleura is affected, the pain is purgent, fixed and greatly aggravated by inspiration; the pulse is hard, there is difficulty in lying on one side, and the cough is short, distressing and generally without expectoration.

Pneumonitis may terminate in four ways, viz. resolution, suppuration, gangrene or effusion of serum or blood into the bronchial cells and cellular texture of the lungs, producing almost instant suffocation.

The means to be had recourse to in inflammation of the chest are copious venesection, antimonials combined with nitre and other refrigerants, purgatives, blisters, demulcents, rest, and the most rigorous abstinence; expectoration must be promoted first by ipecacuanha and antimonials, afterwards by squills, balsam of Peru, gum ammoniac and seneca. In the suppurative stage the strength ought to be supported by nutritious diet and tonic medicines.

It is sometimes very difficult to determine whether a wound has entered the cavity of the thorax or not, although the emission of air from the wound, for the most part indicates that the bag of the pleura has been penetrated; and as it is not important to know, the treatment always being regulated by the existing symptoms, and if no urgent ones arise, officious examination should never be employed to discover the extent of the wound.

The mode of treatment in penetrating wounds of the thorax should be to remove all foreign bodies, the wound immediately closed, the patient laid in bed with his head

and shoulders elevated and his thighs bent towards the abdomen, and inflammation obviated by copious bleeding, rest and a diligent perseverance in every antiphlogistic measure. If they be complicated with wounded intercostal artery, protrusion of the lungs or emphysema, the treatment proper for each of these must be adopted.

In wounds of the lungs, the patient immediately after the injury coughs up frothy blood, feels faint, is affected with difficulty of breathing, a sense of suffocation and dreadful anxiety; blood and air issues from the outer wound; and if it be not free, emphysema soon begins to make its appearance.

The consequences of wounds of the lungs are extravasation of blood both into the cavity of the chest and into the air cells, emphysema, and inflammation.

The measures to be taken in cases of wounded lungs, should be, copious abstraction of blood from the arm, to diminish the internal hemorrhage; after this extract all foreign bodies within reach, remove the extravasated blood, then close the external wound, and lay the patient in an easy posture. If the pain, cough and dyspnœa return, we again employ venesection, and repeat it as often as necessary. Mild purges must be administered, the most rigorous abstinence prescribed, and leeches and blisters applied to the heart.

When any of the great blood vessels within the thorax are wounded, the patient immediately faints, frothy blood is discharged at te mouth, his pulse becomes weak and hurried, his extremities cold, his face pallid and ghastly, his lips livid, and his skin covered with cold perspirations; the thorax and bronchiæ being filled with blood, respiration becomes frequent and laborious, dreadful feelings of anxiety come on, he lies struggling for a short time, and

then expires. In such cases suffocation is so speedily produced by the internal hemorrhage, that little or no time is allowed for the application of any remedies, but very copious bleedings are the only means that promise relief.

When suppuration and hectic fever arise from wounds of the breast, which consequences are most probably occasioned by the lodgment of some extraneous matter within the chest, the removal of which should be effected as soon as possible, and the patient's strength supported by nutritious diet and tonic medicines.

WOUNDS OF THE ABDOMEN.

Wounds of the abdomen are divided into those which are superficial and affect merely the skin and muscles; into those that just penetrate the abdominal cavity, but do not injure any of its contents; and lastly, into those that not only enter the cavity, but injure some of the contained viscera.

The incised muscular wounds should have the lips approximated by placing the patient in a suitable position, and retained by compress and bandage; every antiphlogistic plan must be employed in order to prevent inflammation. After the wound has cicatrised, a broad bandage should be worn for some time round the abdomen, to prevent the occurrence of hernia.

Lacerated and gunshot wounds of the abdominal parietes are to be managed according to those principles already recommended, when situated in other parts of

the body ; especial care being taken to guard against inflammation, which is sometimes apt to extend from the surface to the peritonæum.

The dangers to be apprehended from punctured wounds of the tendons of the abdominal muscles, are extensive inflammation of these parts, often followed by large collections of purulent matter.

Acute pain and tension of the abdomen, violent symptomatic fever, sickness, delirium, hiccough, and dreadful spasms of the whole body, are the symptoms of the inflammation.

The line of practice to pursue in such cases, is to freely and repeatedly bleed by the lancet and leeches, while warm fomentations and poultices are kept constantly applied to the part affected. Active cathartics, antimonials, low diet, diluent beverage, and every other reducing plan, ought likewise to be had recourse to, until the inflammation and fever subside. If suppuration follows, which is indicated by shiverings and the subsidence of pain, a free opening must be made, and the abscess evacuated without delay.

The effects of very violent contusions of the abdomen are, laceration of the blood vessels or viscera, or inflammation of some abdominal organ, frequently terminating in abscesses.

If the rupture be extensive, the patient will most probably very soon die ; if slight, he may recover, and we employ blood-letting and other depleting means to arrest the peritoneal inflammation which effusion has produced. If inflammation be excited without extravasation, it must be subdued by the usual means ; should it continue, suppuration will be produced, the opposed surfaces of the injured organ and parietes of the abdomen will adhere, and

as soon as the abscess points externally, a free opening must be made into it and the matter discharged.

Wounds of the cavity of the abdomen are particularly dangerous in consequence of the injuries frequently sustained by the great blood vessels, the vital organs, and the numerous and important nerves which it contains, and owing to the extravasation of the contents of the viscera, and the susceptibility of the peritonæum to inflammation.

We determine whether a wound has penetrated the cavity of the abdomen or not, by there being excessive pain; when by the introduction of the finger through the wound, the central smooth surface of the peritonæum and the intestines can be distinctly felt; when the opening is not in the tract of the epigastric artery, and yet much blood is discharged; when there are symptoms of internal hemorrhage; when blood is vomited or expelled by stool; when bile, feculent matter, &c., flow from the wound, we may infer that the abdominal cavity has been entered, and some of the contained organs injured.

When it is doubtful if a wound has entered the abdominal cavity, we should endeavor by bleeding and other antiphlogistic means, to prevent peritoneal inflammation, which is one of the principal and most frequent consequences of wounds of the abdomen.

The symptoms of peritonitis are, the abdomen being tense, swollen, and so painful and tender, that even the slightest pressure cannot be endured; the patient is unable to sit erect, his pulse is small and quick, his tongue dry, and his countenance ghastly; there is great fever, restlessness, difficult respiration, and vomiting or diarrhœa.

The patient must be copiously and repeatedly bled,

and warm fomentations and blisters applied to the abdomen ; mild purgatives, diaphoretics, and oleaginous clysters, are to be administered, and the warm bath, low diet, and other reducing means had recourse to.

Wounds which penetrate the abdomen should have all extraneous matter removed, and then the patient be placed in the best position to relax the muscles, and to allow us to approximate the lips of the wound, which we retain by plasters and bandages. We must have recourse to copious and repeated venesection, oleaginous clysters, mild purgatives, low diet, fomentations, the warm bath, and other antiphlogistics, to subdue the fever and inflammation.

Sutures must be employed as seldom as possible, as they generally occasion great pain, and often peritoneal inflammation. In small longitudinal wounds they are never necessary, but in very large or transverse ones almost indispensable ; lest the intestines should be wounded, the needle must always be entered at the peritonæum, and passed from the central through to the peripheral surface of the abdominal parietes.

The viscera that are most commonly protruded through the wounds of the abdomen, are the omentum and small intestines ; and in large wounds, the stomach, larger intestines, and sometimes the liver.

Protrusions most commonly occur when the sacral part of the abdomen is wounded.

If a portion of intestine protrude, it should immediately be returned in the following manner : the patient being placed upon his back, his head, shoulders and pelvis elevated, so as to relax the abdominal muscles, the surgeon gently pushes, in a perpendicular direction, the displaced bowel into the abdomen, taking care that the

last protruded portion is first reduced, and the first protruded part the last reduced. Having ascertained that the intestine is quite lodged within the abdominal cavity, he closes the wound and secures it by plaster and bandage; he then draws twenty or thirty ounces of blood from the arm, and diligently employs every antiphlogistic measure, until all symptoms of inflammation disappear.

If the whole displaced part were returned at once, or the pressure applied obliquely, the difficulty of reduction occasioned by this unskilful management, the bowel might suffer such violent contusion as would cause it to inflame; or it might be forced between the layers of the abdominal muscles, and become strangulated.

The cause which impedes the reduction is the smallness of the wound, and distention of the bowel by air or fœces.

The first is to be remedied by enlarging the opening at its atlantal side, unless the epigastric artery or umbilical vein, which we must be careful not to injure, is situated at this part; in such cases we make the incision at the sacral edge of the wound.

The course of the epigastric is this: it arises from the external iliac just as it is about to pass under Poupart's ligament. It crosses the external iliac vein, and running obliquely atlantad, it passes dorsad the spematic cord and mesiad the upper abdominal ring. A little above the pubes its oblique course is altered, and it runs parallel with the linea alba, on the dorsal aspect of the rectus abdominis, at first laying between this muscle and the peritonæum, but afterwards between the muscle and its sheath; near the umbilicus it anastomoses with its fellow, and then with branches from the internal mammary artery.

The second impediment is to be overcome by gently but steadily pressing the fœces or air into the unprotruded part of the intestine. If this cannot easily be accomplished, an oleaginous enema, or one of cold water and salt, may be administered.

No punctures should on any account be made through the bowels to give egress to air, for small openings in the intestines are perfectly ineffectual, as they are immediately closed by the mucous membrane falling over them; and large ones never fail to excite dangerous, and not unfrequently fatal inflammation.

Protruded intestine is the most difficult of reduction, as it is most frequently distended with either air or fœces.

If the omentum be diseased or mortified it must be cut off and its bleeding vessels if necessary secured; if the protruded intestine be gangrenous an incision must be made into it to allow the fœces to escape; and if a free evacuation be not thus obtained the stricture ought be divided.

If the protruded intestine be wounded and the opening be small the loose villous coat will soon close it and prevent effusion; in this case therefore we apply no stitches, but restore the bowel as speedily as possible to its natural situation; if the aperture be somewhat larger, and just allowing the fœces to escape we take hold of it with forceps and then include it in a ligature, the extremities of which to be cut off close; the protrusion is next to be returned into the abdomen, the lips of the outer wound brought together by plaster and bandages, and inflammation prevented by the usual means.

If the intestine be partially divided the wound must be closed by one or more stitches, according to its extent; if it be divided through its whole circumference the separated extremities are to be brought together by four or

five sutures. After the ends of the ligatures are removed the reduction of the bowel and the closure of the external wound are next to be accomplished and the inflammation subdued by the speedy and active adoption of every antiphlogistic measure.

The circumstances to be attended to, to accelerate the recovery is, the patient's body being so placed that the wound occupy a depending situation to permit the feculent matter more readily to pass out; gentle aperient glysters must be frequently administered, and the food ought to be liquid and not likely to excite flatulence.

If there be a large incision in an intestine it might safely be returned without first stitching up the wound; for if the wounded bowel be replaced, and the opening in its coats cotinnue for some time, opposed to the central lips of the external wound, it becomes fixed in this situation by the adhesive inflammation; effusion is prevented and the fœces are discharged through the aperture in the abdominal parietes. In time the intestinal matter again passes along its natural channel and the external wound heals up. Longitudinal wounds of the intestine heal more readily than transverse.

If there be no protrusion, the indications by which we ascertain whether any viscus be injured or not is by some of the secretions or fœces being discharged from the outer wound, blood is either ejected from the stomach or passed by stool, and to these succeed pain, tension of the abdomen and all the symptoms of acute peritoneal inflammation.

The symptoms peculiar to wounds of the stomach and to the large and small intestines, besides being attended with discharge of their contents, acute fever and inflammation; wounds of these parts are accompanied with

fainting, weak tremulous pulse, cold extremities, horror and paleness of the countenance, great anxiety and cold perspirations. When the liver is injured, the skin assumes a yellow appearance, and is affected with the most intolerable itching.

The viscera when wounded are productive of the greatest danger, as the liver, the stomach and small intestines; wounds of the large intestines are the least perilous.

The cause of the small intestines when wounded being attended with the greater danger is from their increased vascularity, and their functions being more important to life.

Effusion does not invariably follow wounds of the hollow abdominal viscera, for it only happens when the bowel at the time of the accident is very full, and the wound in its coats extensive or lacerated. Extravasation within the abdomen is prevented by a contrivance of nature in the contraction and pressure of the abdominal muscles and diaphragm which preserves the contained viscera in close contact with the central aspect of the parietes of the abdomen and when the cavity is penetrated and the bowel injured, inflammation comes on in the circumference of both wounds which are kept in accurate opposition; coagulating lymph is thrown out, the surface of the peritonæum covering both the abdominal muscles and intestines unite, and thus extravasation is effectually prevented.

The effused fluids that are the most dangerous are urine and bile; next to these are the fœces and blood.

With injuries of the abdominal viscera unaccompanied with protrusion, the chief object should be to subdue inflammation by repeated venesection and every other anti-

phlogistic plan; applying leeches and warm fomentations to the abdomen, using the warm bath, unloading the bowels by oleaginous glysters and not allow the patient to take either solid, flatulent, or large quantities of liquid food.

When the bladder is penetrated, besides the employment of the strictest antiphlogistic means an elastic gum catheter should be introduced along the uretha and allowed to remain until the urine has ceased to be extravasated; it is sometimes prudent to evacuate by an operation, blood effused within the abdomen, when it is of considerable quantities and productive of bad symptoms and its situation distinctly ascertained.

PORRIGO.

This is the most prevailing form of cutaneous disease, depending on local causes; and principally affects the hairy scalp, consisting of a pustulous eruption, from which scales generally are formed by the escaping of their contents, varying in color, consistency and extent according to the species of the disease, of which there are six.

Porrigo larvalis, is limited to infants and generally occurs during the period of lactation. It commences by small white pustules on the forehead or cheeks, — these are continually breaking, and from their contents yellowish scales are formed, which thicken and spread by this moisture from the numerous little vessels, eventually extending, if not previously mitigated, so as to envelope the whole face in a mask as it were.

The child's health is not materially affected by this disease, and though protracted, generally terminates favorably.

The cure of this is much facilitated by an occasional small dose of mercury.

The surface of the diseased part should be bathed carefully with tepid water and when dried a little ung. zinci or ung. plumbi smeared over the surface.

Porrigo furfurans, makes its appearance on the scalps of adults and more especially of females; it commences with small pustules, the fluid from which soon concretes, and forms innumerable lamellated scales; at irregular intervals the eruption moistens and then becomes dry again and exfoliates; there is a degree of itching and irritation attending this disease, which sometimes occasions enlargement of the neighboring glands.

For its treatment it is necessary to keep the scalp shaved, or what is better in all cases, the hair closely cut by scissors. The scales should then be soaked off by warm water every day. The applications at first should be of a mild character, as for instance, the ung. plumbi carbon or ung. zinci, which will suppress the little inflammatory action attending the onset of this disease. Afterwards a more stimulating ointment may be used, as the ung. hyd. nitrati, or the tar and sulphur ointment.

Porrigo lupinosa, is discriminated by the scab resembling the lupin seed, hence its name, it is dry, circular, straw colored, with raised edges, its situation is not confined to the head.

Porrigo scutulata, ring worm, or scald head. At the commencement of this disease there may be noticed upon

different parts of the scalp small pustules, often in circles, sometimes in clusters, the ichorus discharge from which generally concretes into scabs more or less thick, according to the accumulation. On removing these concetions with warm water, we observe the surface red and shining, studded with pustules which are interspersed with others that are ruptured, and in the form of small pits or ulcers, each of which we shall notice has in its centre a hair, to the bulb of which this ulcer extends, and the attachment which the hair had scarcely existing, as will be observed by removing it with a pair of forceps as an extraneous body; after which these little cavities readily heal up.

If this disease is neglected the acrimony of the discharge will cause it to spread over the whole scalp, or by it be communicated to other parts of the skin, either of the same individual or others.

Porrigo scutulata occurs from about five years old to puberty; it is sometimes unmanageable even for years, though it never continues after that period.

Under some circumstances this disease is very contagious, as is evinced sometimes in large schools. It may arise spontaneously, which it often does aided by a want of cleanliness.

The *treatment* of this species, which is by far the most obstinate, should be commenced by having the whole hair closely cut by scissors, which must be kept so. The head should be washed with warm water and soap, at least twice a day, and all loose hairs removed by a pair of small forceps; the applications may be made either in the form of ointment or lotions retained by means of an oil skin cap; the ointment may be of equal parts of picis liquid, sulphuris, cerat cetaciæ, which

should be smeared over the head after each washing; or ung. hyd. nitrat. A solution of argent nitrat, or the acid acet. fort. should be used by means of a small brush to the less inflamed parts, two or three times a week. A lotion is sometimes recommended of liquor calcis and ox. hydrarg. or solution of sulphatis zinci — also to vary the applications.

Porrigo decalvens presents no further appearance than circular patches of baldness, and the scalp within their area being shining and white.

The treatment should consist in having the head shaved and then applying stimulating ointments and embrocations.

Porrigo favosa consists of an eruption of pustules called favi; these are large, flattened, and of an irregular edge, inclosed in a reddish circle and soon become confluent, they are confined to no particular part of the body; the disease is generally commenced on the scalp, or behind the ears and then makes its appearance in other parts by blotches. Children are most subject to this disease from the age of a few months to five or six years. It sometimes occurs in adults.

This species of porrigo is often a source of considerable irritation — its discharge may like the other species communicate the disease.

The *application* may be ung. zinci or ung. hyd. præcep. with which alternative medicine is frequently required.

DISEASES OF THE EYE.

OF THE APPENDAGES OF THE EYE.

The diseases most common to the appendages are, psorophthalmia, purulent ophthalmia, erysipelas over the lachrymal sac, inflammation, blennorrhea, hernia, and hydrops of the lachrymal sac, obstruction of the nasal duct, epiphora, stillicidium lachrymarum, fistula lachrymalis, pterygium, encanthis, entropium, ectropium, hordeolum, ptosis, lagopthalmus, symble pharon, anchyloble pharon, encrysted tumours of the eyelids, and tumours of the lachrymal gland.

The symptoms of psorophthalmia, are an itching of the tarsal edges of the eyelids, accompanied with a morbid and acrid secretion from the meibomian glands, which during sleep glues the ciliary margins firmly together, and causes such irritation in them that they at length ulcerate ; the cheek is sometimes inflamed or excoriated, and when the disease has been of long standing, the eyelid becomes everted from tumefaction of its lining membrane.

The causes of this affection are ophthalmia, cold, measles, and small pox.

The general remedies are aperients and alternative medicines; the local ones in the acute stage are warm opiate and saturnine applications ; and when the disease has become chronic, a little of the ung. nit. hydrarg. must be rubbed on the edges of the eyelids every night, by means of a hair pencil.

PURULENT OPHTHALMIA.

This disease commences in the tunica conjunctiva, and is very sudden in its attack ; when severe, it is

attended with excruciating pain in the eye, and the most intolerable headache, and high symptomatic fever. The edges of the palpebræ are red and tumefied, and separated with difficulty; the conjunctiva lining them is severely inflamed, swollen, frightfully protrudes, and at length becomes studded with hard, fleshy granulations. When the inflammation extends to the conjunctiva sclerotica, this membrane is of a pale red color and much thickened; the cornea appears sunk, loses its transparency, and then ulcerates; the humours of the eye flow out and its coats collapse, or the iris protrudes, or staphyloma is produced, or the whole organ is completely destroyed. In the beginning of the disease there is a discharge of thin whitish mucus, but as it advances pus is poured from the eye in great profusion, and the eyelids are edematous, and appear of a dark bluish color. The causes of this disease are, impure atmosphere, cold, intense light, gonorrheal matter applied to the eye, and contagion.

In the first stage there should be bleeding, general and topical; purgatives, low diet, exclusion of light, and the frequent removal of the purulent matter; injecting tepid water beneath the eyelids, and by the constant application of warm anodyne fomentations and poultices. In the second stage, astringents, as cold solutions of sulphate of zinc or alum, conjoined with small quantities of vin opii, should be employed.

Ectropium should be removed by slowly raising the eyelid, and then drawing it quickly towards the other, and obviated by applying gentle pressure over the eye, particularly when the patient is agitated.

Fleshy excrescences on the palpebral conjunctiva are to be removed by excision, or by the application of escharotics, as solutions of sulphate of copper or nitrate of silver.

The symptoms which indicate a favorable termination of this complaint, is the inflammation not being severe, or confined to the palpebral conjunctiva and meibomian glands, or there being a copious hemorrhage from the eye; but when the inflammation has affected the globe of the eye, and there becomes very violent, and when the remedies resorted to have failed to give relief, the prognosis may be considered unfavorable.

EGYPTIAN OPHTHALMIA,

Is a species of purulent ophthalmia, accompanied with the most violent and destructive inflammation and symptomatic fever. It begins in the tunica conjunctiva of the lower eyelid, and from thence spreads to that portion of the membrane covering the sclerotica and upper eyelid. The parts affected are extremely red and swollen; the pain at the commencement of the disease is slight, but soon after becomes most agonizing, is often remittent, generally more severe in one eye than another, and sometimes affects the head. Blood is effused into the cellular membrane connecting the sclerotic and conjunctive tunic, producing chemosis, and there is a profuse secretion of yellow purulent matter mixed with tears. The palpebræ are distended and edematous, their edges meet and become inverted, and the inner surface of their lining conjunctiva is covered with granulations; these when the tumefaction diminishes evert the tarsal edges, which now appears broad and gaping. The cornea is more or less opaque, and at length ulcerates; if the ulceration be extensive, the humours of the eye escape, and its whole structure is perfectly annihilated.

The disease is epidemic, arising from a peculiar miasma existing in the atmosphere, particularly in hot

marshy countries; it can also be communicated from one person to another by the actual contact of the discharge, which is most violent in the acute stage.

The patient must first be bled from the temporal artery until he faint, then leeches applied to the turgid conjunctiva, and blisters to the nape of the neck, or behind the ears; the bowels must be freely evacuated, and nausea or full vomiting produced by the exhibition of large doses of tartrate of antimony; the eye ought frequently to be fomented by warm anodyne lotions, while sulphuric acid is applied to the conjunctive tunic, to prevent the formation of granulations; if these excrescences have become hard, they should be removed by a pair of scissors or lunar caustic. Light must be excluded, and the severest abstinence prescribed. In the chronic stage of the disease, solutions of sulphate of zinc or acetate of lead, and the ung. nit. hyd. are of the greatest utility when applied to the eye.

The symptoms of gonorrheal ophthalmia are precisely similar to those of the Egyptian ophthalmia.

The disease may be occasioned either by the sudden suppression of a discharge in the urethra, arising from venereal infection, or by the direct application of gonorrheal matter to the eyes.

The treatment does not vary from that of common purulent or Egyptian ophthalmia.

The symptoms of purulent ophthalmia of new-born infants do not differ from those of common purulent ophthalmia, and are often as violent as the Egyptian variety.

The causes of this complaint are cold, gonorrheal matter applied to the eyes, &c., &c.

In the first stage, there should be bleeding and other

antiphlogistic means; in the second or chronic stage, astringent applications, as solution of alum and sulphate of zinc, are to be employed. If there be any ulceration or opacity on the cornea, it must be removed by a weak solution of nit. argent. or an ointment made of the prussiate of potassa and axunge. In short, the remedies for this disease are not different from those used in the other species of purulent ophthalmia.

ERYSIPELAS OVER THE LACHRYMAL SAC.

When the parts covering the lachrymal sac are affected with erysipelatus inflammation, at the mesial angle of the eye a slight swelling appears, of a bright red color, smooth and shining, accompanied with pain and burning heat; this swelling spreads to the cheek, forehead and eyelids, particularly the upper one.

The puncta lachrymalia appears shrunk, and the tears flow over the cheek; if the inflammation be moderate, thin mucus is discharged from the nostril of the affected side; if severe, it extends to the lachrymal sac, and the nostril is quite dry. The patient is affected with headache, fever, and derangement of the digestive viscera.

The consequences of this disease when the inflammation has not been very severe, is its terminating in resolution, which for the most part leaves a stillicidium lachrymarum, which however soon disappears as the puncta and lachrymal passages speedily regain their natural action and vigor. When the disease has been violent, it terminates in abscess, which generally bursts, externally, by several small openings, and sometimes also into the lachrymal sac.

To ascertain if the abscess communicate with the lachrymal sac or not, a probe should be introduced into

the sac, and thence into the nasal duct; if there be a very large quantity of purulent matter discharged, and this sometimes mixed with mucus or tears, or if pus and mucus escape at the puncta, by applying pressure on the nasal angle of the eye, we conclude that the abscess and cavity of the lachrymal sac have some communication with each other.

The means to be employed in the first stage should be, aperients; and occasionally emetics must be administered to restore the healthy action of the digestive organs, and cold lotions constantly applied to the affected part; if abscess form, it ought to be opened as soon as possible, lest it should burst into the lachrymal sac. If the abscess has already burst into the lachrymal sac, it should be frequently washed out by injections of warm water, and then a piece of lint dipped in opium wine inserted into it.

If the blennorrhea continue, a portion of lint touched with ung. nit. oxyd. hyd. must be well introduced into the external opening, and astringent collyria, combined with vin opii, applied to the eye, and injected into the lachrymal sac. As the discharge abates, the wound should be closed, when the tears usually resume their natural channel into the nose.

INFLAMMATION OF THE LACHRYMAL SAC.

In the first stage of this complaint, a very hard, painful, red, circumscribed, bean-shaped tumour, appears at the mesial angle of the eye; the inflammation and swelling generally extends to the eye-lids, and sometimes to the cheek, the puncta are closed, the absorption of the tears is interrupted, and they flow over the cheek; the nasal duct is obstructed, and the nostril of course is with-

out moisture; the patient complains of severe headache, and is often affected with considerable fever; in the second stage, the tumour is increased, of a deeper red color, soft, fluctuating, and less painful.

The fever and inflammation of the first stage are to be subdued by bleeding, purgatives, low diet, and cold applications. If the tumour be likely to suppurate, emollient poultices are to be had recourse to, and when it becomes very soft and fluctuating, and a yellowish point appears at its top, it must be freely opened by a lancet.

After the swelling is opened, tepid water, or diluted solutions of sub-acetate of copper, or sulph. alumen, must be injected into the sac, and astringent collyria and ung. nit. oxyd. hyd. applied to the eye. If after the disease has subsided, the tears have no passage into the nose, one must be formed.

BLENNORRHŒA OF THE LACHRYMAL SAC.

It is characterised by a soft tumour situated at the nasal angle of the eye and attended with little or no pain. When pressed, a viscid matter mixed with tears is discharged through the puncta, but seldom through the nasal duct, and therefore the nostril on the affected side, is for the most part dry; the eye is irritable, there is an abundant secretion of tears, the meibomian glands are enlarged and turgid, the conjuctiva of the palpebræ looks inflamed, and covered with a glutinous substance which during sleep joins their thickened edges together.

The causes of blennorrhœa of the lachrymal sac, are inflammation of the schneiderian membrane or a morbid affection of the meibomian glands. The disease is always aggravated in cold damp weather, and relieved during warm dry seasons.

If this disease be connected with the derangement of the chylopoietic viscera we must endeavor to correct this by gentle cathartics and proper regimen. Twice a day the patient must be laid on his back and the contents of the sac evacuated either through the puncta or nasal duct, but through the latter if possible; the eyelids then being separated, a few drops of a week solution of oxymuriate of mercury or of very diluted nitric acid are to be put into the eye; after these a little of the ung. nit. ox. hyd. must always be applied to the palpebræ conjunctiva.

A small soft tumour situated at the nasal organ of the eye unattended with pain or redness are the indications of a hernia of the lachrymal sac; when slight pressure is applied to it, the mucous fluid which it contains, either regurgitates through the puncta, or flows out at the nasal duct.

A graduated compress is to be bound by a moderately tight bandage over the swelling, to which powerful astringent lotions are frequently to be applied.

When both the lachrymal canals and nasal duct are obliterated, the mucous secretion of the lachrymal sac cannot escape, it therefore accumulates and in time causes at the mesial angle of the eye a very hard, large, blue colored tumour called hydrops sacculi lachrymalis.

The tumour must be opened and the cavity of the lachrymal sac destroyed by escharotics and pressure.

OBSTRUCTION OF THE NASAL DUCT.

The causes of this obstruction are inflammation and thickening of its mucous membrane, the duct is also obstructed, by viscid matter lodging in it, or by adhesion of its sides.

When the nasal duct is obstructed, the lachrymal sac,

owing to the mucus and tears accumulating in it, is swelled into a small yielding tumour from which the contents can be pressed out through the puncta. If the sac be inflamed, purulent matter is also discharged; the nostril is dry, the eye watery and the tears fall over the cheek.

If the obstruction arises from inflammation in the acute stage, it is to be subdued by cold applications, purgatives and proper regimen; in the chronic stage, and when the mucous lining of the nasal duct is swollen and indurated, the lachrymal sac must be emptied in the same manner as directed above and a weak solution of corrosive sublimate dropped in the eye, while the disordered condition of the meibomian glands, and palpebral conjunctiva is removed by the application of the ung. nit. hyd. and astringent collyria and improving the general health.

The removal of viscid matter from the nasal canal is to be accomplished by frequently injecting with some degree of force warm water into the lachrymal sac and nasal duct, through the lower punctum lachrymale, and by correcting the morbid state of the meibomian secretion.

If these means fail, the duct must be examined in the following manner: the patient being seated and his head secured by an assistant, the under eyelid is to be stretched towards the temporal angle by the thumb or fore finger so as to render more conspicuous the tendon of the orbicularis palpebraum, immediately beneath which a small puncture is to be made into the lachrymal sac; through this a slender probe is to be introduced, and when it is fairly within the sac, it must be raised vertically so that its point may enter the nasal duct, along which it must be pushed basilad and somewhat iniad. If

the instrument be stopped, it should be twirled between the finger and thumb, and turned in different directions in order that the obstacle may be overcome. When it has passed the whole length of the tube, it must be allowed to remain for a few days, then removed and a larger one introduced. The size of the probe ought to be increased after every three or four days, until the passage is quite free, and the tears again flow into the nose. Lukewarm water containing a small quantity of opium wine, must occasionally be injected into the lachrymal sac to ascertain the degree of perviousness of the nasal canal, and it will be sometimes proper to wash out the puncta and lachrymal ducts with the same mixture, by means of Anel's syringe. Cathartic and alterative medicines are diligently to be administered, and if the meibomian glands appear diseased, a little of the ung. nit. hydrarg. should be applied to the palpebral conjunctiva every night.

If the nasal duct be much thickened and indurated, a solution of oxymur. hydrarg. should be daily injected through it from the lachrymal sac, and a small quantity of mercurial ointment rubbed on the side of the nose.

When a part of the duct is obliterated, that portion must be perforated by a long small trocar. As soon as the instrument has entered the nostril, which is known by the discharge of blood, it should be withdrawn, and a blunt probe or silver style introduced in its stead.

The following is another mode adopted : — The upper eyelid being held by the left finger and thumb, and everted near the nasal canthus, one of Anel's probes is introduced at the superior punctum, and pushed mesiad, and somewhat basilad, into the lachrymal sac ; the instrument now being raised nearly to a perpendicular

direction, its point is made to enter the orifice of the nasal duct, along which it is carried basilad and iniad into the nose. If there be only a very slight obstruction, it is overcome by withdrawing the probe a little, again pushing it on and directing it various ways; as soon as it has entered the nostril, it is pulled out, and tepid water injected at the puncta, through the whole lachrymal passages. The operation is performed once a day, the thickness of the instrument being gradually increased.

The operation to be preferred is that in which the lachrymal sac is punctured, as the frequent introduction of the instruments through the puncta and lachrymal canals destroy their functions, and often cause them to inflame and ulcerate.

FISTULA LACHRYMALIS.

The first stage has already been described; it consists of a small swelling near the mesial angle of the eye, arising from an obstruction of the nasal canal, in consequence of which the tears are not conveyed into the nose, but collect in and distend the lachrymal sac, from which, by gentle pressure, they can be made to flow out at the puncta, being mixed with mucous, and sometimes purulent matter; when the sac inflames, becomes ulcerated, and the pus, mucus, and tears are discharged through the ulcerated opening, it constitutes the second stage of the disease, or true fistula lachrymalis.

The inflammation first being subdued by an emollient poultice and a few doses of aperient medicine, a small probe should be introduced through the fistulous orifice, and conveyed along the nasal canal into the nose; the obstructions are to be overcome, and the rest of the treatment conducted in the way already recommended.

If every means fail to render the nasal duct pervious, a perforation must be made with a curved trocar, through the os unguis which lies at the inial aspect of the lachrymal sac, and separates it from the cavity of the nose. The instrument should be pushed obliquely basilad to avoid injuring the superior spongy bone; as soon as the puncture is made, blood drops from the nostril, and air, frothy blood and mucus can be expelled through the wound by blowing the nose. After the trocar is removed, a thick silver style must be introduced through the aperture, and allowed to remain, until a free and permanent passage is established between the eye and nasal cavity.

The operation of perforating the os unguis rarely requires to be performed; it possesses no advantages, and is frequently unsuccessful, for unless the opening be made very large, it is soon closed by granulations springing up from the schneiderian membrane; sometimes it is followed by disease and exfoliation of the bones composing the nasal duct.

EPIPHORA.

This is an excessive secretion of tears, which collecting on the anterior surface of the eye, render vision very indistinct.

Extraneous bodies adhering to the ball of the eye or lodging between it and the eyelids, ophthalmia, and relaxation of the secreting parts of the lachrymal organs, are the causes.

The measures to be taken, are a speedy removal of the exciting cause, which, when depending upon the relaxation of these parts which secrete the tears, we must have recourse to gentle stimulants and astringent applications. Ectropium is sometimes produced by epiphora.

STILLICIDIUM LACHRYMARUM.

When the tears are not conveyed through the puncta or along the lachrymal passages into the nose, but accumulate on the surface of the eye, then pass over the cheek, which it excoriates, the disease is termed stillicidium lachrymarum.

A loss of action or debility of the puncta and lachrymal ducts, by inflammation of these parts, or of the lachrymal sac or nasal canal, are the causes of this disease, also contraction and total obliteration of these passages.

Inflammation of the lachrymal sac, and stricture or complete closure of the nasal duct, are the most frequent causes of this disease.

Stillicidium lachrymarum will require measures according to the cause of the complaint; relaxation of the puncta and lachrymal canals may be removed by the external application and injection of astringents; contraction by the introduction of Anel's probes; but the perfect obliteration of these passages is incurable.

PTERYGIUM.

This is a name given to a triangular shaped membranous excrescence of a reddish or gray color, commonly arising at the mesial angle of the eye, and gradually extending towards the transparent cornea, which it sometimes completely covers.

There are four species of pterygium, viz. the pterygium tenue, pterygium crassum, pterygium malignum, and the pterygium pingue.

Pterygium tenue is a thin, semi-pellucid, ash colored

membrane, attended with no pain, and appearing to grow from the membrana semilunaris; the pterygium crassum is a very thick, fibrous mass, of a deep red appearance, very vascular, and without pain; when the pterygium crassum becomes painful, of a vermilion color, or variegated, disposed readily to bleed, and firmly attached to the cornea, it is called malignum; the pterygium pingua is soft, of a straw color, not painful, generally appearing at the temporal angle of the eye, and never so diffused as the other species of the disease.

Two or three pterygium occasionally appear on the same eye at once.

The invariable triangular figure of the excrescences of pterygium distinguishes it from every other disease, with its base upon the white of the eye, and its apex towards the pupil, the looseness of its adhesions, and the facility with which it can be raised from the surface of the cornea, render the diagnosis of the pterygium perfectly easy.

It is most frequently met with among the aged, and is the consequence of violent ophthalmia, during which the serous vessels of the conjunctive tunic covering both the sclerotica and cornea, are distended with red blood; these vessels become varicose, while the membrane itself remains relaxed and thickened.

Pterygium differs from chronic varicose ophthalmia in the sclerotic and corneal portion of the conjunctiva being affected, whereas chronic varicose ophthalmia consists in a morbid dilatation of the veins, and tumefaction and laxity of only the former part of the membrane, and never extends to the cornea.

The operation of removal may be performed in this way:—The patient being properly placed, the pterygium must be laid hold of near its apex by a pair of small for-

ceps; the surgeon then raising it up, separates it by means of curved scissors, from the surface of the cornea transparens, as far as the sclerotica, commencing at the extreme point of the excrescence, and dissecting towards its base. The remaining part of the triangular mass is now to be elevated, and with a portion of the adjoining relaxed conjunctiva, cut away from the eye by a transverse semicircular incision.

When the diseased membrane is removed, the eye must be well fomented, and as soon as the hemorrhage has ceased, covered with a pledget of lint moistened with a saturnine lotion. The patient should be kept quiet, live abstemiously, and inflammation prevented by antiphlogistic means.

ENCANTHIS.

A small, soft, mulberry-like tumour, arising from the caruncula lachrymalis and semilunar membrane; after it has increased to a certain size, it extends along the conjunctiva lining the eyelids towards the temporal canthus, and spreads also over that which covers the nasal side of the eye, which is generally in a state of constant inflammation; when large, it impedes the closure of the palpebræ at the mesial canthus, and pushing aside the puncta, prevents the absorption of the tears, and thus causes stillicidium lachrymarum.

When the disease becomes cancerous, the excrescence is of a dark red color, very hard, and attended with severe darting pain that extends to the eye and forehead; the slightest touch causes it to bleed, at length it ulcerates, and then emits a thin fœtid discharge; the eye is watery, and the lower palpebræ commonly everted.

To remove encanthis, the tumour must be raised by a pair of forceps or hooks; the surgeon then detaching it with a pair of curved scissors, close to its base, from all the parts to which it is connected, taking care not to cut away too much of the caruncula lachrymalis; after which, the eye must be washed with cold water, and in a few days the wound touched with the sulph. alum. to accelerate its cicatrization, and if any ulceration remain, it should be removed by applying to it a little lunar caustic.

When the encanthis has advanced along the eyelids, the following should be the plan: — The upper eyelid being everted by an assistant, a deep incision, following the margin of the tarsus, is to be made into the elongation, which is then to be laid hold of by a pair of forceps and separated throughout its whole extent, from the central aspect of the eyelid, proceeding from the temporal towards the nasal angle of the eye. The elongated tumour on the lower eyelid is to be detached in a similar way. The body, or that part of the encanthis growing from the caruncula lachrymalis, semilunar fold, and conjunctiva of the eyeball, must next be raised, and removed from its attachment by a pair of curved scissors. When the operation is finished, cold water or mild astringent collyria ought frequently to be applied to the eye.

If the disease return after extirpation, and assume a malignant character, the most prudent measure would be to remove the whole eye.

ENTROPIUM.

In this complaint the cartilaginous margin of the eyelid is inverted, by which the ciliary hairs are pressed

against the conjunctive tunic of the ball, and excite in it pain and inflammation. When the entropium has existed some time, the eyelids become thickened, and their integuments unusually red, the cornea turns opaque, prominent and indurated, sometimes ulcerates, and vision is totally lost.

The eye-lashes are sometimes inflected while the tarsus remains in its natural position; this modification of the disease is by far the most difficult of cure.

Entropium is most commonly observed in the upper eyelid; it seldom involves the whole of the tarsus, but affects only a portion of it, and that generally next the lateral canthus of the eye; occasionally the two eyelids are affected, and sometimes the disease appears in both at once.

The causes are relaxation of the skin of the eyelids, occasioned by previous chronic inflammation and swelling, or by constant and improper application of warm poultices and fomentations, disease of the meibomian glands, and the cicatrices of wounds or ulcerations on the palpebral conjunctiva.

The following must be the operation: — The patient being seated, and his head raised, the surgeon with a pair of forceps or his fore finger and thumb, must elevate exactly opposite the middle of the entropium as large a portion of the skin of the affected eyelid as will be sufficient to replace the tarsus and ciliæ in their natural position; he next cuts out this fold of skin as closely to the margin of the eyelid as possible, and then by adhesive plaster or a small suture approximate the lips of the wound, which is of an oval figure, having its widest part nearly in a line with the middle point of the inverted tarsus.

Simple inversion of the eye-lashes should have the inflected hairs frequently plucked out, and then the edges of the palpebræ washed with aqua ammon. or solution of nit. argent.

This affection is seldom produced by the contraction of cicatrices, but generally by encysted tumours or inflammation, and thickening of that part of the conjunctiva which passes from the eyelid to the globe of the eye; these pushing outwards the orbitar margin of the palpebræ, the ciliary edge becomes inverted by the action of the orbicularis muscle.

To relieve entropium of the lower eyelid, if it be occasioned by inflammation, we reduce it by the usual means; when from tumours or indurations of the conjunctiva, these must be cut away, and the eyelids supported by compress and bandage.

ECTROPIUM.

In this the eyelids are retracted and their conjunctive tunic exposed, and of a pale red color, the eyeball is dry and inflamed, the tears flow over the cheek, and vision is impaired; in the progress of the disease, the conjunctiva by constant irritation becomes thickened, fleshy, and at length indurated, and the cornea ulcerated or opaque.

One species is occasioned by turgescence and relaxation of the conjunctiva of the eyelids, produced by violent inflammation; the other is caused by contractions of the skin covering or in the vicinity of the eyelids, induced by the cicatrices of small pox, pustules, burns or wounds.

The disease most commonly occurs in the inferior eyelid, and is occasionally seen in both at the same time.

When ectropium arises from the first cause, and the swelling of the palpebral lining is not great, the frequent application of caustic will for the most part remove the complaint.

The more inveterate form of ectropium, produced by the relaxation of the palpebral conjunctiva, must be relieved by cutting away close to the orbicular muscle the thickened and inflamed tunic of the eyelid, with a pair of curved scissors or small bistoy. After the operation, the eye must be washed with cold water, the palpebræ supported by compresses and bandage. The relaxed state of the conjunctiva should be removed by the frequent application of the ung. nit. hyd. and astringent lotions.

Ectropium arising from contraction of the skin, although accompanied like the first with tumefaction of the lining membrane of the eyelid, is easily distinguished from it by the presence of the puckered scars, the confined state of the palpebræ, and the inability to extend it over the surface of the ball; when not very considerable, it can be cured by the excision of the fungus swelling of the conjunctiva. As the wound heals up, the eyelid, though somewhat shortened, will be drawn back nearly to its natural position.

After the patient is properly seated, an incision is to be made into the swollen and protruded conjunctiva in the direction of the edge of the tarsus; the tumour being raised by a pair of small forceps, is to be dissected from the whole of the central aspect of the palpebræ, proceeding from the ciliary to the orbitar margin. As soon as the operation is finished, the eyelid should be restored to its proper situation, and properly secured by compresses and bandage. If inflammation supervene, it must be subdued by the usual means.

When this species of eversion is very considerable, it must be remedied in the following manner: — The surgeon having properly placed his patient, cuts out from the whole breadth of the eyelid, at a small distance from its temporal extremity, an angular portion resembling in shape the letter V; the diseased conjunctiva is next to be detached, and when the hemorrhage has ceased, the lips of the incision must be joined by the interrupted suture. After the operation, the eyeball ought to be covered with a compress and bandage, and inflammation prevented by antiphlogistic measures.

Ectropium occurring in aged people is to be removed by the frequent application of the argent. nitrat. and astringent lotions to the thickened conjunctiva, and supporting the eyelid with compress and bandage.

HORDEOLUM.

A little hard, painful tumour, appearing at the edges of the eyelids, but most commonly on the inferior one, and near the mesial angle; it is of a deep red color, attended with very violent inflammation, never perfectly suppurates, but its cavity is filled with a serous, bloody fluid, and a white slough of dead cellular membrane. It is generally caused by deranged state of the digestive organs.

In the commencement of the disease, when it is quite superficial, there should be cold applications used; in the more advanced state, when the inflammation has affected not only the skin but the cellular substance, warm fomentations and anodyne poultices; as soon as the tumour becomes soft, it should be opened with a lancet, and its contents pressed out. Afterwards astringent

lotions must be applied to the seat of the disease, and a little of the ung. nit. hyd. every night. During the cure, the disordered state of the chylopoietic viscera is to be corrected by a course of aperient medicine, by light diet, and country air.

A little lunar caustic is to be applied to remove the induration that sometimes remains, until it is entirely dispersed.

PTOSIS.

Ptosis is a preternatural relaxation or falling down of the upper eyelid, and an inability of elevating it, and is in consequence of its integuments being so redundant and relaxed, thus impeding the action of the levator palpebræ muscle; it may be induced by previous inflammation, tumours on the eyelid, a paralytic state of the levator palpebræ, and spasm of the orbicularis muscle.

When the disease arises from a redundance of the integuments, it is to be removed as follows: — The surgeon, near the coronal edge, and midway between the angles of the upper eyelid, taking hold of it and elevating as much of the superfluous skin as will allow the levator palpebræ to execute its proper functions, with a pair of curved scissors or knife cuts it out, and then closes the wound with suture, adhesive plaster, and bandage.

When ptosis depends on paralysis of the levator, cold water should be frequently dashed upon the eye, and stimulating embrocations well rubbed upon the forehead and temples; electricity and the shower bath, gentle aperients, and tonic medicines, must be prescribed; in spasms of the orbicularis, blisters should be applied to the temples or behind the ears, narcotic fomentations to the eye and its surrounding parts; antispasmodics ought

to be administered, and when the affection is symptomatic, the original disease must first be removed.

LAGOPHTHALMUS.

In this disease the surface of the eyeball is left uncovered in consequence of an inability to close the eyelids. The free motion of the palpebræ being interrupted, the tears are not pressed into the puncta, and there is a constant stillicidium ; the eye is irritated and inflamed by dust and other extraneous matter adhering to it, and the patient can bear only a very weak light.

The most frequent causes of this disease, are cicatrices on the integuments of the eyelids ; it is also produced by enlargement of the eyeball, staphyloma, and paralysis of the orbicularis muscle.

When the disease depends upon paralysis, this should be relieved by blisters, electricity, embrocations, cathartics, and tonic medicines ; when it is occasioned by puckered cicatrices, these must be divided, the eyelids extended, and the lips of the wound prevented from uniting except by granulation, by means of oiled lint being inserted betwixt them.

SYMBLEPHARON.

An adhesion of the palpebral conjunctiva to that covering the surface of the eyeball, and occurs more frequently in the superior than in the inferior eyelid.

Ulcers of the cornea, excoriations on the conjunctive tunic of the eyeball or palpebræ, are the causes of this complaint.

This disease is to be relieved if the adhesions be not

firm, extensive, and over the whole or a greater part of the cornea, for in these instances it is incurable; but if they be loose, very partial, and at a distance from or only just on the edge of the cornea, they may be divided with a scalpel, and the reunion of their cut surfaces prevented by frequently moving the eyelids, and introducing between them and the globe of the eye, a small probe smeared with a little mild ointment.

ANCHYLOBLEPHARON.

This is a concretion of part or the whole of the tarsal margins of the two eyelids.

It is sometimes a congenital affection, but most commonly occasioned by excoriations, burns, or very severe opthalmies.

For the removal of anchyloblepharon, if there be any opacity of the cornea, a division of the adherent parts is useless; but when this is not the case, we should separate with a scalpel the united ciliary edges, and fix between their cut surfaces a piece of oiled lint, until they are perfectly healed.

ENCYSTED TUMOURS OF THE EYELIDS.

The kinds of encysted tumours generally found to form upon the eyelids, are the melicerous, and atheromatous kind.

They are for the most part situated upon the temporal side of the superior eyelids; when immediately under the skin, they are very movable; but when beneath the orbicularis muscle or levator palpebræ, and adhere to the

conjunctiva or cartilage of the tarsus, they are more fixed.

These frequently acquire such a large size as to press upon and inflame the eyeball, and when situated on the inferior eyelid, occasionally give rise to ectropium.

They should be extirpated according to the following plan: — The tumour, for a few days previous to the operation, is to be moved about to loosen its adhesions; the surgeon then seats his patient, and fixing the tumour between his left fore finger and thumb, makes an incision through the skin, in the direction of the fibres of the orbicularis muscle; when the cyst of the tumour is fairly exposed, it must be taken hold of with a small hook, and dissected out. The lips of the wound are to be brought together by adhesive plaster, over which a pledget of lint and bandage should be applied. When the tumour is covered by the orbicularis, it should be removed from the central side of the eyelid, which must be well everted before commencing the operation.

We should be careful to remove none of the integuments, as this might occasion ectropium; and when the operation is performed on the central side of the eyelid, and the tumour adheres to the tarsus, we must never cut away any of the cartilage, lest ectropium be produced.

TUMOUR OF THE LACHRYMAL GLAND.

In these cases there is an obtuse pain in the situation of the lachrymal gland, which extends to the temple and forehead, and becomes gradually more severe, the eye is inflamed and pushed from the socket, its motions are impeded, and vision is either grealy impaired or completely lost.

The tumour should be removed as follows: — The upper eyelid being raised, the surgeon introduces his knife beneath it, and dividing the parts covering the enlarged gland, at length brings it into view; he then pushes through it a hook, and pulling it gently towards him, cuts the diseased mass completely away from its situation. After the operation, a compress and bandage should be applied, the patient kept quiet, and inflammation prevented by the usual means.

DISEASES OF THE EYEBALL.

These are ophthalmia lachrymosa, ophthalmia iridis, hypopium, exophthalmia, pustules, ulceration and opacity of the cornea, staphyloma, hydrophthalmia, prolapsus of the iris, closure of the pupil, cataract, amaurosis, hemeralopia, nyctalopia, cancer, and fungus hamatodes.

OPHTHALMIA LACHRYMOSA.

This is common inflammation of the eyes. In the first stage there is observed running along the sclerotic coat a few small red vessels, which soon become so numerous as to cover the whole surface of the eyeball, and communicate to it a light red color; there is a copious discharge of tears, and an inability to bear the light; the eye is affected with great heat and pain, which extends to the temples, forehead, and sometimes even to the nose; the eyelids are swollen and tender, their lining membrane is inflamed, and there is a sensation as if particles of sand were lodged under it; the patient at the same time complains of thirst, his countenance is

flushed, his skin hot and dry, he has a quick pulse, and other symptoms of fever.

In the second stage of lachrymose ophthalmy, the redness and swelling of the eye are increased, but there is a diminution of pain, heat, and febrile excitement; the admission of light can be borne with less inconvenience, the tears are not secreted in such abundance, and upon the ciliary edges of the eyelids a viscid fluid collects, which during sleep glues them firmly together.

The seat of lachrymose ophthalmy is the tunica-sclerotica.

The acute form of lachrymose ophthalmy is characterized by its extreme severity. From the violence of the inflammation, the secretion of the tears is suspended; the eyeball feels hot, extremely tense, and is affected with excruciating pain that shoots to the bottom of the orbit, and is greatly aggravated by the presence of light; blood is extravasated into the cellular substance between the sclerotica and conjunctiva, in consequence of which the latter tunic becomes elevated, and presents a red, fleshy appearance, termed chemosis; the cornea seems depressed, generally turns opaque, and sometimes ulcerates; the eyelids are inflamed and turgid, and there is violent symptomatic fever, accompanied with throbbing pain in the temples and forehead.

The most frequent causes of the disease, are cold, foreign bodies lodging on the eye, acrid exhalations, vivid rays of light, and wounds or other injuries of the eye.

The opacity in the cornea is produced by the effusion of coagulating lymph, either under the conjunctive tunic or between the layers of the cornea.

When the lachrymose is very slight, it generally disappears under the use of astringent lotions; but when more severe, the following treatment must be adopted:— In the first stage, after all extraneous substances irritating the eye have been removed, warm anodyne fomentations and emollient poultices are to be kept constantly applied to the inflamed organ; blood must be taken away from the temples and the mesial angle of the eye by means of leeches, blisters applied to the nape of the neck or behind the ears, active cathartics administered, quietude and low diet prescribed, and light completely excluded. In the second stage, the eye should be exposed to a warm, dry air, and to as great a degree of light as it can endure without uneasiness, and frequently washed with the liquor plumbi subacet or solution of sulphate of zinc or alum, a small quantity of vin opii may be dropped into the nasal canthus once or twice a day, and the edges of the eyelids smeared by means of a hair pencil, with a little of the ung. nit. hyd. or ung. nitric oxyd. hyd. every night.

The plan of treatment to be pursued in the acute form of lachrymose ophthalmy, is, that the patient be bled to syncope, either from the temporal artery or the arm, and leeches applied to the inflamed eye itself; a large blister placed behind the ear or on the nape of the neck, and the eye covered with an emollient poultice, and repeatedly bathed with warm anodyne fomentations, while thin cloths wetted in cold evaporating lotions are to be constantly applied to the forehead and temples. Tartrate of antimony is to be administered so as to produce nausea or free vomiting, and the bowels well emptied by active purgatives; the patient confined to a dark room, and allowed only the sparest diet. When there is purulent

matter in the anterior chamber of the eye, or when the eyeball is greatly distended and the cornea opaque, this coat may be punctured and the aqueous humour discharged. In the second stage, the cautious admission of light astringents, and other remedies already recommended, are to be resorted to.

To remove the chemosis, after bleeding and other depleting measures have been employed, a piece of linen cloth moistened with ether should be laid over the eye, and if the conjunctiva appears much distended, it may be divided by a lancet at the edge of the cornea.

OPHTHALMIA IRIDIS.

There are four species, viz. idiopathic, syphilitic, rheumatic, and mercurial.

In idiopathic, deep within the eye is felt an obtuse pain, which becoming more violent and lancinating, extends above the eyebrow and darts through the brain. The pressure of light is intolerable, the pupil is irregularly contracted, and deprived of its bright black appearance; vision is impaired; the iris thickens, its motions are diminished, and its color changed, first in its lesser circle, which becomes darker, then in its greater, which turns green if in health it were gray or blue, and reddish if it had been brown or black. The vessels of the sclerotica become enlarged, of a carmine color, and run towards the transparent cornea, over which, however, they are not continued, but form round its edge a circle, and then pass to the inflamed iris. The pupillary margin is serrated, and turned towards the crystalline lens, with the capsule of which, it, and sometimes the whole uvea, contract adhesions, while coagulable lymph, in the

form of a delicate gray film, closes up the pupil, and not unfrequently fills the posterior chamber. If the disease be not arrested, the iris continues to thicken, and at length adheres to the cornea, which becomes more and more opaque, or small yellowish red abscesses form between the greater and lesser circles of the iris, then burst, and discharge their contents into the anterior chamber. The disease now abates, but as the iris has lost its mobility, and the pupil is filled up by coagulable lymph, the power of sight is nearly, if not altogether destroyed.

In syphilitic iridis the disease is extremely tardy in its progress and attended with little pain; the vessels of the sclerotica are enlarged, and form a reddish copper colored ring round the edge of the cornea; this tunic in a short time becomes uniformly turgid, and at length affected with white looking ulcers, which also appear upon the sclerotic coat and integuments of the eyelids; the iris loses its original hue and power of motion, it advances towards the cornea, and one or more dusky red excrescences spring up from its surface; the pupil is contracted, irregular, cloudy and carried from its natural situation towards the root of the nose; the eye is peculiarly affected by varieties of temperature; at night a violent pain fixes in the head above the eyebrow, and the discharge of tears, intolerance of light and uneasiness in the eye are exasperated; but in the morning these symptoms and the severe headache abate.

At the commencement of rheumatic iridis, the eyeball is affected with great distension and excruciating pain, that extends to the face, temple and side of the head, where it generally becomes more intolerable than in the eye itself; for the most part its violence is increased at night, and sub-

sides towards morning; innumerable minute ramifications of red vessels completely cover the whole surface of the sclerotica, which has somewhat of a yellowish tinge; the secretion of tears at first is interrupted, but afterwards becomes very profuse; the conjunctiva is elevated and the cornea grows opaque, while small vesicles appear upon its surface, and bursting, leave little ulcers; when the inflammation extends to the interior of the eye, the presence of light is insupportable, the iris is motionless, changes its color and projects towards the cornea, the pupillary margin is irregular and turned iniad toward the capsule of the lens, and a gray flake of coagulating lymph fills up the contracted pupil.

Mercurial iridis advances very slowly, and is accompanied with the erythema mercuriale; the pain is less severe, and the presence of light more tolerable than in the other species of ophthalmia iridis; the vessels of the conjunctive tunic are increased in size, have a dark appearance, and extend to the edge of the transparent cornea; the color of the iris is changed, and there sometimes appears upon it a small yellow vesicle, which if not dispersed by proper remedies discharges its contents into the anterior chamber; the effusion of lymph is seldom considerable, and the pupil is not much contracted.

The termination of ophthalmia iridis is by effusion or suppuration.

The most common causes of ophthalmia iridis is the operation for cataract. It is also produced by accidental wounds of the eyeball and the extension of acute external ophthalmy to the deeper textures of the eye. Iridis occasionally presents itself along with chronic rheumatism, gout, syphilis, and during the abuse of mercury.

The prognosis is to be considered favorable when the

inflammation is not violent or extensive, but chiefly confined to the iris corpus ciliare, and lens; when the effusion of lymph is moderate, occupying only a small portion of the pupil, and soon becoming absorbed, and when the motion and natural color of the iris are returning.

It is to be considered unfavorable when the inflammation has affected the vitreous humour, retina and choroides, and diffused itself over the whole eyeball; when internal suppuration has supervened, and pus and blood nearly fill both chambers of the eye; when coagulating lymph completely closes up the whole pupil, and the anterior chamber is obliterated; when the iris continues immovable, and is united to the capsule of the lens, or to the inflamed and thickened cornea.

In idiopathic iridis the blood should be repeatedly and copiously abstracted from the general system by opening the temporal artery or veins of the arm, and topically by means of leaches; the bowels should be evacuated by the free exhibition of active purgatives, and nausea excited by proper doses of tartrate of antimony. Warm anodyne fomentations ought frequently to be applied to the eye and a large blister to the nape of the neck; with these means are to be conjoined the exclusion of light, quietude and the most rigid abstinence.

When the inflammation has somewhat subsided and the effusion of lymph commenced, mercury should be freely and diligently administered, in order that the system may be soon brought under the influence of its action, which will not only prevent further extravasation and counteract adhesion, but will accelerate the absorption of lymph already effused.

The manner in which mercury is best employed is the calomel or pil. hydrarg. c. opio, internally, and the ung.

hyd. mixed with the same anodyne, well rubbed on the eyebrows, until gentle ptyalism be produced.

The other applications which ought to be used in the second stage are the ext. belladonna, which must be rubbed on the eyelids, or rendered thinner by an admixture of water and dropped into the eye ; it causes expansion of the pupil, by which the adhesions, especially if they be recent, are elongated or ruptured ; and the power of vision, in a great measure restored.

In syphilitic iridis, calomel, with opium and the mercurial ointment, must be employed, so as to speedily affect the constitution ; mild aperients should be administered, and leeches applied to the temple of the affected side ; the nocturnal pains are to be relieved by covering the eye with a bag of heated bran, and rubbing well in above the eyebrow a little ung. hydrarg. mixed with opium.

Rheumatic iridis, in the first stage, should be repeatedly bathed with warm anodyne fomentations, the alimentary canal freely acted upon by brisk cathartics, and a large blister placed behind the ear or on the nape of the neck ; if these means fail to give relief, the aqueous humour must be evacuated, and a small quantity of blood drawn from the arm, or by one or two leeches applied to the neighborhood of the eye ; after the inflammatory action has undergone some diminution, and the effusion of lymph taken place, mercury in conjunction with opium and belladona, in the manner already directed, ought to be actively used, to prevent, if possible, adhesions of the iris, closure of the pupil, and consequent destruction of sight.

Mercurial iridis is to be treated by moderate bleeding, gentle purgatives, and mercury, with opium and belladonna.

HYPOPIUM.

This is a collection of viscid coagulating lymph, of a yellow color, in the anterior chamber of the aqueous humour, and often also in the posterior one, which is discharged from the vessels of the choroides and other internal membranes of the eye, when these are in a high state of acute inflammation.

Along with great heat and agonizing pain in the eyeball, redness and intumescence of the palpebræ, intolerance of light, chemosis, contracted pupil, severe headache, fever, and other symptoms of violent ophthalmia, a yellowish fluid is perceived at the bottom of the anterior chamber of the eye, which gradually increases, and at length conceals the pupil and the whole of the iris; if the inflammation be not checked, this fluid accumulates in great quantity, the cornea is distended, becomes prominent, and at last ulcerates; the humours of the eye and the glutinous matter are discharged, a temporary abatement of pain is experienced, and then succeeds prolapsus of the iris.

Hypopium is to be treated in the first instance, by all those means which tend to subdue the violence of the inflammation, such as copious and repeated venesection, powerful cathartics, nauseating doses of antim. tart., and low diet; warm anodyne fomentations, mild emollient poultices, and blisters behind the ears.

After blood-letting and other antiphlogistics have been employed, and the inordinate vascular action has in some degree abated, the further effusion of lymph must be obviated, and the absorption of what is already effused, accelerated by the liberal exhibition of calomel, by the application of blisters to the nape of the neck, by

exposing the eye to the vapors of spir. ammon. comp. or sulph. ether, and by frequently washing it with a collyrum of sulph. zinci.

When great distension of the eyeball and other dangerous symptoms are produced, when the cornea threatens to ulcerate, and the structure of the whole eye seems ready to be ruined in consequence of the enormous accumulation of coagulating lymph, the operation ought to be performed of discharging the accumulated lymph by making an opening in the transparent cornea.

EXOPHTHALMIA.

A displacement or protrusion of the eyeball from the orbit, by means of external violence or the pressure of tumours, &c. and is generally accompanied with loss of vision.

The causes which produce it are severe concussions of the head, narrow instruments forcibly pushed between the eyeball and socket and bony aneurismal, or other tumours situated in the orbit, frontal sinuses, antrum maxillare, or neighboring parts.

When this is the effect of violent blows on the head or of a bayonet, small sword or stick thrust between the orbit and globe of the eye, the dislocated organ should be returned to its natural situation as speedily as possible and inflammation obviated or reduced by bleeding, purgatives and other antiphlogistics both general and local; if suppuration follows the purulent matter should be allowed to escape as soon as it is formed.

The eyeball should be replaced in its natural position, unless the muscles and other parts that fix it to the orbit be extensviely lacerated and contused.

When the eyeball is forced from its socket by a tumour or abscess, the tumour if possible ought to be removed; if this cannot be effected the whole eye should be cut away; and when the protrusion is occasioned by an abscess, this must be punctured and its contents evacuated without delay.

Tumours ought to be removed from the orbit in the following way, the patient being properly placed, the eyelid must be held aside, the conjunctiva divided, the tumour laid hold of by a small hook, drawn forwards and then dissected from its bed.

ABSCESSES OF THE CORNEA.

They are of a yellowish color, elevated and attended with redness and inflammation of the conjunctiva, great tension of the eyeball, intolerance of light, contracted pupil, and increased secretion of tears; they are slow in bursting, and as soon as this happens, the concomitant inflammation is increased and a small ulcer occupies the place of the abscess.

The pus is collected either beneath the cornea conjunctiva, or among the layers of the transparent cornea; when it is betwixt the more superficial lamellæ the abscess appears more prominent, and its fluctuation is more perceptible than when amongst the deeper ones, in which case, it sometimes escapes into the anterior chamber of the aqueous humour.

The causes of pustules or abscesses of the cornea are inflammation, scrophulous diathesis, &c.—They are more common in early than in advanced life.

The treatment of abscesses of the cornea consists in

gentle aperients combined with tonic medicines; the local ones, are in superficial pustules, astringent solutions, vin. opii. and ung. nitric oxyd. hyd.; in the deeper kind, warm fomentations, emollient poultices and blisters behind the ears.

It is better to allow abscesses on the cornea to burst spontaneously, as the matter which they contain is so viscid and tenacious as to be with great difficulty discharged through punctures, which only tend to aggrevate the inflammation.

ULCERS OF THE CORNEA.

These have an ash-colored surface surrounded with high and irregular edges; discharge an acrid serous fluid and are accompanied with great pain and symptoms of acute ophthalmy.

The result of these ulcers if they be small is their healing without diminishing the transparency of the cornea: but if they spread superficially they generally leave such an opacity of this coat as greatly to impede vision; when they penetrate the anterior chamber of the eye, the aqueous humour escapes, and the iris sometimes protudes, and should the ulceration increase, the crystalline lens and vitreous humour are discharged and the whole eye completely destroyed.

They are either produced by the bursting of a small abscess, or by extraneous matter placed in contact with, and continually irritating the eye.

A piece of nit. argent. should be formed into a point and applied to the surface of the ulcer, which is immediately converted into an eschar and in a great measure

deprived of its smarting and extreme morbid irritability; as soon as the eschar is detached, and the pain and heat of the ulcerated part and ophthalmy return, the caustic is again to be had recourse to and repeated as often as necessary, care being taken after each application of it, to wash the eye well with some warm liquid; in time the ulcer contracts and shows a disposition to heal. The diligent administration of cathartics greatly accelerate the cure.

The employment of the caustic should be interdicted wherever the surface of the ulcer loses its pale ash color and assumes a light red or pinkish appearance, which commonly happens after the third or fourth application; after caustic is relinquished the eye should be frequently bathed with cold astringent lotions, and preserved from the air and light.

If ulceration of the transparent cornea occur during an attack of severe ophthalmy, the inflammation, which in this case is the cause and not the consequence of the ulcerative process, should first be subdued by antiphlogistic measures, and as soon as this is effected the ulcer must be managed as already recommended: When the ulceration threatens to perforate the layers of the cornea, it ought to be punctured at a distance from the ulcerated point and the aqueous fluid evacuated.

In slight excoriations of the cornea there should be frequent applications of an astringent collyrium.

OPACITIES OF THE CORNEA.

Nebula or superficial opacity of the cornea is a thin whitish turbid spot, covering the whole or a small part of the surface of the cornea by which vision is more or less

impaired; it is preceeded by chronic ophthalmy and accompanied with relaxation of the sclerotic and corneal conjunctiva, and an enlarged and varicose state of the veins of this membrane, both in their trunks and minute ramifications.

Albugo is a dense speck of a clear pearl color, sometimes situated upon the surface, but for the most part between the lamellæ, or in the very substance of the cornea; seldom attended with inflammation and never permanent dilatation and turgescence of the veins of the conjunctiva.

Leucoma is a thick, white, indurated cicatrix extending over the whole or greater part of the transparent cornea.

The cause of nebula is long continued chronic ophthalmy, during which white lymph is extravasated immediately beneath, or into the very texture of the corneal conjunctiva.

Albugo is produced by an effusion of coagulating lymph between the layers of the cornea from the excited arteries, during severe acute ophthalmy.

Leucoma is occasioned by wounds attended with loss of substance or by ulcers of the cornea.

In the treatment of nebula we must first endeavor to make the enlarged vessels contract and resume their natural size by frequently applying to the eye stimulating and astringent medicines which if the disease be recent and not extensive often prove successful; when these means are ineffectual, we should dissect off a part of the fasciculus of the preternaturally enlarged and varicose veins, in this way.

The patient being properly secured, the surgeon with a pair of small forceps raises up the plexus of varicose vessels, which along with a small portion of the relaxed

adjoining conjunctiva, he cuts away, by means of curved scissors, as near as possible to the junction of the cornea and sclerotica; the bleeding from the divided vessels ought to be promoted by the employment of warm fomentations; when it has ceased the eye should be be closed, and for several days bathed with mild emollient collyria; gentle aperients and calomel are to be prudently administered, and if inflammation come on it must be checked by the proper means.

When albugo is just forming in the first stage of acute ophthalmy, and the structure of the cornea remains uninjured, it generally vanishes under the use of venesection, purgatives, low diet, warm fomentations and poultices; but when it has existed some time, and the inflammation subsided or become chronic, calomel should be given, blisters applied behind the ears, and topical stimulants, as vin. opii. ung. nit. oxyd. hyd. to the eye itself in order to excite the action of the absorbents that they may more speedily remove the dense effusion of lymph; when these measures fail the albugo should be frequently punctured or scratched with a couching needle.

In leucoma the natural organization of the cornea is destroyed, and therefore the disease is incurable.

STAPHYLOMA.

This is an opaque pearl colored protuberance of the whole cornea of a spherical or pyramidal form, at first soft, but gradually acquiring a firm consistence, and attended with stillicidium lachrymarum and perfect abolition of sight. The diseased cornea not only projects beyond the eyelids, preventing the closure, but becomes thickened and extending iniad obliterates the anterior chamber of the aqueous fluid, and touches or adheres to the iris.

From its constant exposure to the air and contact of foreign bodies, and from the friction of the ciliæ the eyeball is always affected with inflammation which is sympathetically communicated to the other eye; there is often severe headache, and in consequence of the pressure of the enlarged cornea and the continual irritation, the cheek and inferior eyelid inflames and at length ulcerates.

The appearances which staphyloma also presents is the surface of the tumour instead of being even is occasionally covered with small flesh-like excrescences, sometimes it involves only a part of the cornea, and sometimes it arises from the whole or a great portion of the sclerotica.

The causes of this complaint are repeated ophthalmies, small pox, wounds, blows, &c.

Staphyloma is to be remedied by caustics or excision. Caustic is most advantageously employed in recent cases of staphyloma and those affecting only a part of the cornea; the method of applying it in recent staphyloma is this: the patient should be laid upon his back, and the eyelids held asunder, a camel's hair pencil dipped in a solution of caustic potass or nit. of silver, or in oxygenated muriate of antimony, is to be applied to the bottom of the tumour; this operation ought to be repeated every day, so that a small artificial ulcer may be formed which should be kept open until the staphyloma disappears. Any inflammation should be obviated by frequently washing the eye with emollient liquids and saturnine collyria.

In partial staphyloma the surface of the tumour must be touched with oxygenated muriate of antimony by means of a hair pencil and then washed with warm water, when the white superficial slough that is thus

formed separates and the inflammation appears quite diminished, the caustic should be again applied and renewed at proper intervals as long as the disease remains unrelieved.

The large inveterate staphyloma is to be removed by the following operation: the patient's head being properly supported and his eyelids held asunder, the operator introduces a cataract knife at the temporal side of the cornea, a small distance from its junction with the sclerotica, and in a line with the axis of the eye and carrying it in a horizontal direction completely through the tumour, and cutting downwards separates its lower half by an incision of a semicircular figure. The flap thus formed being then raised by a pair of dissecting forceps the upper half of the tumour is to be cut away, immediately after which the humours of the eye escape, and the eyeball sinks within the orbit; the palpebra are next to be closed and covered with a piece of dry lint supported by a bandage; the subsequent inflammation is to be reduced by purgatives warm fomentations and emollient poultices, and the little papillæ left in the middle of the cornea after the cicatrization of the wound, removed by the application of a little nit. argent.

HYDROPHTHALMIA.

When the aqueous or vitreous humour, or both of these together are collected in an immoderate quantity, the disease is termed hydrophthalmia or dropsy of the eye.

The capacity of the anterior chamber of the eye is enlarged, and the cornea broader and more prominent; at the commencement of the disease, this coat preserves its transparency, but afterwards acquires, as

does also the aqueous fluid, a slight turbidness; the eye-ball is hard and distended, its size gradually augments, and in proportion as this takes place, its motions become more and more impeded; at first it is affected with a sense of weight and pressure, afterwards with pain that shoots often with intolerable violence through the head. The sclerotica is of a bluish color, from the turgescence of the veins; the pupil is partially dilated, the iris becomes of a darker hue, quite motionless, appears situated more iniad and quivers when the eye is turned or gently struck with the finger. In the beginning of the complaint, the patient labors under præsbyopia, the lens grows cloudy, the sight is gradually weakened, paralysis at last affects the retina, and total blindness follows; after the eye-ball has protruded from the orbit, it presses upon the lower eye-lid and cheek, and causes them to ulcerate; the eye itself, owing to its constant exposure and dryness, and the friction of the ciliæ, is attacked with acute opthalmy that terminates either in complete disorganization or carcinoma of the whole organ, sometimes accompanied with caries of the orbital bones.

When hydrophthalmia chiefly depends upon a morbid alteration, and increase of vitreous humour, the whole eye-ball, but particularly the inial part, undergoes considerable enlargement, and becomes of a conical figure, the anterior chamber seems diminished, the iris is motionless, but retains its original hue, and is pushed towards the cornea, which does not lose its translucency; the movements of the eyeball are sooner interrupted, the pupil is more contracted; the sclerotica of a darker color, the pain in the eye and head begins earlier and continues more severe, than when the disease arises from an increase in the quantity of the aqueous humour alone; in

the early stage of the complaint, the patient is affected with myopia, and vision is very speedily destroyed.

The change which the structure of the vitreous humour suffers is this: the humour itself losing its natural degree of density and becoming thin and watery, while the tunica hyaloidea is converted into a spongy and fatty substance.

Hydrophthalmia is produced by blows on the eye or temple, internal opthalmy, disorder of the constitution, or a morbid state of the coats of the eye; it frequently accompanies other hydropic diseases, and sometimes arises without any evident cause.

In the early stage of the disease, endeavors should be made to improve the general health, and by the administration of calomel, digitalis and other diuretics, to promote the absorption of the accumulated fluid; a seton should be put in the nape of the neck, and the eye frequently bathed with warm fomentations and covered with emollient poultices.

If the disease still advances, the superabundant humours ought to be evacuated either by puncture, seton, or by excision of part of the cornea.

The method is this: the patient being seated on the floor, while an assistant, sitting on a chair behind him, secures his head and aids the surgeon in fixing the diseased eye, a small lancet-shaped needle, slightly curved near its point, is to be pushed with its convex side directed iniad through the sclerotica, very near its junction with the cornea, and in a line with the centre of the pupil, into the posterior chamber; the aqueous fluid is very soon discharged, and as soon as the eye returns into the orbit, the eyelids should be closed with a pledget of lint, and if inflammation arise, it should be repressed by bleeding,

purgatives, warm fomentations, poultices, and proper antiphlogistic measures.

The operation of puncture only palliates—never cures the disease, unless it be followed by internal inflammation and suppuration of the eyeball.

To introduce a seton through the eye, the patient being placed as directed above, a small seton needle, to which only a few threads of silk are affixed, should be inserted at the temporal side of the sclerotic coat, about one-fourth of an inch iniad the edge of the cornea, and thrust directly across the axis of the eye; the threads are next to be tied, but not tightly, and the succeeding inflammation diminished by bleeding and the usual remedies. After the inflammation subsides, the silk is to be withdrawn, when the eye is again received into the orbit and covered with the eyelids.

Excision of the cornea is to be performed by the surgeon, after seating the patient, about two lines from the apex, and on the lateral side of the cornea by introducing a cataract knife, and pushing it in a transverse direction towards the mesial canthus, and cutting the lower segment of the cornea into a semilunar flap; this being elevated by a pair of small forceps, the remainder of the cornea is to be detached, the humours should then be pressed out, and when the eye-ball has retired within the socket, the eyelids are to be approximated and covered with simple dressings. The inflammation is to be treated by the usual method.

PROLAPSUS IRIDIS.

In this painful affection, a part of the iris is seen projecting from the surface of the cornea, in the form of a small brown or gray colored tumour, towards which the

pupil is drawn, and at the same time changed from its circular into an irregular oval figure. The very sensible and vascular little tumour, by the continual friction of the eyelids, the acrimony of the tears, and contact of the air, is soon irritated and inflamed; an opaque circle of the cornea forms round its base, and the patient complains of a sharp piercing pain in the eyeball accompanied with an annoying sense of constriction; the tears are discharged in great profusion, the eyelids and the conjunctive tunic are inflamed, and the presence of the faintest light is intolerable. The prolapsed portion at length adheres to the edges of the aperture through which it has passed, and as the inflammation abates, its extreme sensibility diminishes, and in time becomes almost totally destroyed.

Prolapsus or staphyloma of the iris occurs when an ulcer or wound of the transparent cornea allows the aqueous fluid to escape, the delicate iris becomes deprived of its support, and being unable to resist the pressure of the lens and other parts situated iniad to it, and the contraction of the muscles of the eye, it is gradually propelled forward, until at last a part of it protrudes at the same orifice through which the aqueous humour was discharged.

Prolapsus iridis is most likely to occur when there is a wound attended with loss of substance, or an ulcer penetrating through the cornea; because the edges of the opening cannot, in either case, be placed in close apposition, and therefore the aqueous humor is continually flowing out, and the iris forced from its proper situation.

When the protrusion has recently taken place through a simple incised wound of the cornea, the exposed part of the iris ought, as soon as possible, to be carefully

replaced within the eye by means of a small probe; the eyelids should then be closed and covered with a compress and bandage, to preserve the lips of the wound in accurate contact; but when the disease is produced by an ulcer, this treatment is of no utility, because, as the lips of the aperture cannot be placed in close contact, the aqueous fluid on the immediate reduction of the tumour will be discharged, and a part of the iris again project beyond the cornea.

When the prolapsus of the iris is in consequence of an ulcer, or has been of long standing and become adherent to the edges of a wound of the cornea, the little tumour ought, in these cases, to be touched with some escharotic, the best of which is nit. argent. in order to deprive it of its extreme sensibility, and so far reduce it as to allow the opening in the cornea to heal up.

The method of applying the argent. nit. should be, when scraped to a point, by touching the projecting portion of the iris, and then washing the eye with some tepid milk and water, which not only prevents the caustic from acting upon the other parts of the eyeball, but alleviates the very acute pain occasioned by its application. The surface of the little prominence is soon covered with an eschar, which defends it from the friction of the eyelids, and in a short time the pain, epiphora and other symptoms of inflammation gradually subside; as soon as the eschar is thrown off, which happens in the course of two or three days, the constriction of the eyeball and ophthalmy reappear, though with less severity, when the caustic must be again had recourse to, and repeated until the prolapsed part of the iris is reduced to a level with the cornea, after which, its further employment becomes

injurious, by destroying the rising granulations, and exciting inflammation in the conjunctiva.

The best mode of removing those protrusions of the iris, that have grown hard and insensible, is by cutting them off with a pair of convex edged scissors, and then applying caustic to the cut surface to accelerate its cicatrization.

If a recent prolapsus of the iris were cut off, owing to the tumour having formed no adhesions with the edges of the wound or ulcer of the cornea, the moment it was rescinded, the aqueous humour would flow out, and in a short time after, another portion of the iris protrude.

CLOSURE OF THE PUPIL.

This disease is produced by internal ophthalmy; it is also occasioned by protrusion of the iris, or by a gradual contraction and subsequent loss of motion of the fibres of this membrane, which sometimes sooner or later follows operations for the removal of cataracts. It most commonly succeeds the syphilitic kind of iritis.

Closure or obliteration of the pupil presents two kinds, viz., the simple and complicated; the former is not, and the latter is, accompanied with some morbid state of the coats or humours of the eye.

The cure of the simple form is sometimes accomplished by the external application of belladona or strammonium and camphorated vitriolic collyria. When these means are ineffectual, an artificial pupil should be formed.

The operation for artificial pupil is most successful when the dimness of the vision depends entirely on closure of the pupil; and when the patient can easily discover the presence of light.

The operation is less likely to be attended with benefit when the disease is complicated with opacity of the cornea, with cataract, or with adhesion of the iris to the capsule of the crystalline lens.

The operation ought not to be attempted when the eye is affected with dropsy or staphyloma; when the anterior chamber is obliterated, or the eyeball turned soft in consequence of a disorganized state of the vitreous humour; when the natural hue and structure of the iris have become altered, or when the retina is diseased and the patient remains insensible to the strongest light.

The artificial pupil is not capable of contracting or dilating, because the iris after the operation, is perfectly insensible to the stimulus of light.

There are three kinds of operation for making artificial pupil, viz., carotomia or incision, corectomia or excision, and corodialysis or separation.

This is the manner of performing corotomia: the patient being seated, his upper eyelid raised, and his eye fixed, the operator introduces a small sharp-pointed knife, with its cutting edge directed backwards, at the outer side of the sclerotica, two lines from the cornea, and pushing glabellad or forwards, he pierces the iris about a line from its temporal border; he next carefully conveys the instrument across the anterior chamber until its point almost reaches the mesial margin of the iris, when he withdraws it so as transversely to divide this membrane through its centre. After the operation, the eyelids must be closed, and covered with simple dressings, the patient kept quiet, and inflammation prevented by the ordinary means. The disadvantage of this operation is, that the cut edges of the iris are apt to reunite, and vision again becomes abolished.

The operation of corectomia is thus: the patient being properly placed, and the eyelids held assunder, an opening, about a line in length, is to be made with a cataract knife, through the cornea close to its margin; a small quantity of aqueous humour immediately flows out, and a portion of the iris protrudes between the lips of the wound; this protrusion must be seized with a fine hook, and separated by means of a pair of scissors; immediately after the excision, the iris retires within the eye, furnished with a pupil, more or less circular.

If no protrusion takes place, owing to slight adhesions of the pupillary margin to the cornea, as soon as the incision in the cornea is completed, a small hook should be introduced into the eye, and when it is fixed to the fore part of the edge of the lesser circle of the iris, this membrane must be drawn out and a portion of it removed by a pair of small scissors.

If the pupillary margin adheres to that part of the cornea where the artificial pupil is to be made, the iris ought to be laid hold of, at its larger circle, with a small hook, then dragged, and a portion of it cut away by means of small scissors.

The operation of corodialysis is this: after the patient is seated, and his head and eye properly fixed, the surgeon perforates, with a fine straight couching needle, the sclerotic coat of the lateral aspect, about two lines from the edge of the cornea; he then passes the instrument along the posterior chamber as far as the coronal and inial part of the mesial border of the iris, which, to a sufficient extent, he detaches from its very delicate connexion with the ciliary ligament, by pressing the point of the needle, first basilad, and then towards the temple.

The disadvantages attending corodialysis when per-

formed in the above manner, is, the needle in passing through the eye may so injure the lens or its capsule as to lay the foundation of cataract, or the point of the instrument may be pushed through the iris too far into the anterior chamber, and wound the cornea; and the operation is inadmissible if there be any opacity at the mesial border of the cornea, as this would prevent the rays of light from entering the artificial pupil.

There is another mode of performing corodialysis, which is this: — The needle may be made to puncture the cornea, and the iris separated from the ciliary ligament opposite a transparent part of the former membrane, instead of being entered at the sclerotica, and the iris detached at its nasal edge.

Corodialysis is best adapted to those cases of closed pupil, in which only a very minute part of the cornea is transparent, to those in which the posterior chamber is nearly filled with coagulating lymph; and to those complicated with adhesions of the uvea to a capsulo-lenticular cataract.

The symptoms by which we ascertain whether lymph is extensively effused into the posterior chamber, or that a cataract exists, is by the former being attended with the peculiar alteration of color which the greater ring of the iris undergoes; the second by the patient's almost total want of vision.

The cases which should be selected for corectomia are those complicated with opacity of a considerable portion of the cornea, or where this tunic and the iris adhere together, while the lens possesses its natural transparency; also those following extraction of the cataract, and are not accompanied with extensive extravasation of coagulating lymph into the posterior chamber of the

aqueous humour or with opacity of the remaining capsule of the lens.

The cases of closure of the pupil in which corotomia is chiefly indicated, are those where the affection has gradually come on after extracting a cataract; and where the whole of the surface of the cornea is transparent. In removing cataract when it attends closure of the pupil, it ought either to be depressed before making the artificial pupil, or to be freely divided after this is made, and the pieces pushed through the newly formed aperture in the iris into the anterior chamber to be dissolved by the aqueous humour and absorbed.

We should not form an artificial pupil if vision is perfect in one eye; because in consequence of the sympathy that exists between the visual organs, the sound eye would become inflamed, and its power considerably diminished by the operation performed on the diseased eye.

It is sometimes necessary to make an artificial pupil when sight is impeded by an opacity of the cornea, being situated directly opposite and concealing the natural pupil.

CATARACT.

This is a diminution or complete loss of vision produced by an opaque state of the crystalline lens, its capsule or of both.

The most frequent causes of cataract are a long continuance of intense light, looking at minute objects, blows or wounds of the eye, or inflammation of the lens and its capsule; the disease is sometimes congenital, sometimes the consequence of an hereditary taint, and not unfrequently appears to arise spontaneously. It is more frequently met with in old age than in youth.

The symptoms of cataract, are at the commencement of the disease, a mist or cloud appearing before the eyes,

which seems to envelope every object around and gradually becoming more dense; a black circle appears at the edge of the pupil, and behind its centre is observed an opaque spot which grows more and more perceptible, and at length becomes so large as to render vision very indistinct; the iris retains its power of motion, and the patient is able to perceive objects better in a weak than a strong light and when they are placed on one side than directly in front of the eye. The formation of cataract is sometimes speedy, generally slow, and not attended with any pain.

The black circle which is seen at the edge of the pupil arises partly from the dark margin of the pupil, which is naturally invisible, being rendered very conspicuous by the contrast of the white surface of the cataract, and partly by the shadow of the iris falling on the opaque anterior layer of the crystalline capsule.

Cataracts are divided into genuine and spurious.

There are three kinds of genuine cataract, lenticular, capsular, and capsulo-lenticular; the last has several varieties.

There are four kinds of spurious cataract, these are the lymph, the purulent, the bloody and the dendritic.

Cataracts are of different degrees of consistence, some are firm or hard, some milky or fluid; while others are soft or caseous; some cataracts are even of a bony structure.

Cataracts are generally of a bluish white color; but some are yellow, white, green or black.

The characteristic symptoms of the lenticular cataract, are its commencing in the very centre of the lens, is tardy in its progress, generally small and firm and appears situated at a great distance iniad the pupil; its middle part is of a dark grayish color, which gradually acquires

a lighter shade towards the circumference; the motions of the iris are not obstructed, and sight is impaired.

We distinguish capsular cataract by its beginning in the form of very white shining streaks at the edge of the pupil, being dappled, greatly affecting the motions of the iris, and ultimately producing disease in the lens itself; it is subdivided into anterior, posterior, and complete capsular cataract, as the glabellar or inial part, or the whole capsule of the lens is opaque.

The capsulo-lenticular cataract presents a pearl color mixed with very white layers, is of an extremely large size, obliterates the posterior chamber of the eye, and greatly diminishes the anterior one; it forces the iris towards the cornea, renders it motionless, and destroys vision.

Lymph cataract is the effect of inflammation and preceded by pain in the head and eye, the pupil is angular and contracted, and the iris immovable; a flake of very white coagulating lymph is perceived iniad the pupil, and sight is either greatly impaired or quite abolished.

The diagnostic characters of the purulent cataract are, a yellowish colored matter to which the angular and contracted pupil adheres, is observed lying in the posterior chamber. The iris advances towards the cornea, and is deprived of its power of contraction and dilatation, while vision is nearly or altogether destroyed.

The symptoms of blood cataract when it is produced by an unabsorbed effusion of blood in consequence of blows on the eye, is its presenting behind the pupil, which is angular but not very small, a dusky red flake mixed with lines of white lymph; the iris is immovable, and the sight very imperfect; when it is occasioned by extravasations of blood, the result of acute ophthalmy, it appears in the form of a white thick layer occupying the

posterior chamber, is covered with minute spots, and often protuberates into the anterior chamber, through the very contracted and angular pupil; the motions of the iris are lost, and eyesight destroyed.

Dendritic cataract is always a sequent to blows on the eyeball, and accompanied with nearly total loss of vision: the lens and its capsule are displaced by the concussion and soon grow turbid, and an arborescent appearance is observed upon the anterior surface of the latter, which is produced by a portion of the tapetum of the uvea resting there, after having been detached from its proper situation.

A hard cataract is of a dark color, and its anterior surface appears flat; its size is small, which renders the space betwixt it and the pupillary margin large and distinct; the motions of the iris are not impeded, and along the edge of its lesser circle, a black ring is very conspicuous; the patient readily discerns any luminous body, and when the pupil is dilated by belladona, possesses a considerable degree of vision.

The milk or fluid cataract is of a very light color, appears most opaque at its basilar parts, and its surface is dappled with spots or streaks that alter their situation, and alternately disappear and come into view by suddenly moving or pressing the globe of the eye. From the large size and convexity of this cataract, it touches the border of the pupil, and consequently there is no dark circle surrounding the opacity; the iris is pressed forwards towards the cornea, its motions are greatly interrupted and sight nearly altogether destroyed.

The symptom of soft or caseous cataract, is its being of a dirty white or greenish hue, and having a spotted or cloudy appearance, is much larger than the fluid cataract, renders the iris almost motionless, and patient quite incapable of detecting the presence of light.

A secondary membranous cataract is an opacity occurring in the remaining capsule of the lens, after the latter has been extracted.

Congenital cataract is of two kinds; the most common is capsular, and presents a white opacity behind the pupil, formed by the anterior and posterior layers of the crystalline capsule approximating, and then uniting, after absorption has removed the lens, which always happens as soon as this body has become opaque; in the other kind, only the centre of the lens is opaque, its circumference continuing transparent; if it be punctured, however, its whole substance is instantly turbid, and then begins to diminish.

There are diseases of the eye with which cataract may be complicated; being often attended with ophthalmy, hydrophthalmy, pterygium, opacities of the cornea, closure of the pupil, synechiæ anterior and posterior, glaucoma, synchysis or amaurosis.

Glaucoma is a disease of the vitreous humours, in which this substance becomes opaque, and of a green color; when it affects the lens, it constitutes the cataract viridis, which exhibits a greenish tinge, is very large, and attended with severe pain in the head; the margin of the pupil is turned iniad, and drawn out in angles towards the canthi; the diseased lens, owing to its magnitude, protrudes through the pupil, and completely hides the lesser circle of the iris; this membrane loses its natural hue, and becomes perfectly motionless, the vessels of the eyeball are enlarged and varicose, the patient is totally blind, but frequently perceives flashes of fire within the eye.

Cataract is known to be complicated with synchysis, by the eye feeling soft, the iris hanging loosely in the aque-

ous fluid and having a waving motion, and the cataract tremulating when the eye is suddenly turned or agitated.

The symptoms which would induce us to conclude cataract was accompanied with amaurosis, would be the patient's total blindness, the immovability of the iris, and sometimes projecting towards the cornea, and the pupil being exceedingly dilated.

The caseous or soft cataract is of the most common occurrence.

The means to be had recourse to for the cure of cataract, are internal and external medicines, and a variety of operations. The internal medicines are, emetics, cathartics, and sternutatories. The external are, bleeding, issues, blisters, powerful embrocations, and the application of stimulating vapors to the eye.

The different kinds of operation employed for the removal of cataract are, couching, reclination, extraction, ceratonyxis, and dislocation.

Medicines cannot be much confided in, as they are seldom successful in dispersing the disease ; the cases in which they are found most beneficial, are those produced by external violence, although cataracts arising from other causes sometimes disappear under their use.

An operation is likely to be attended with success when the cataract has arisen spontaneously, and is unaccompanied with any morbid affection of the eye or disorder of the general health ; when the patient possesses a ready perception of light; when the pupil is not angular, and when the iris retains its natural power of motion.

An operation is likely to prove unsuccessful when the cataract has been occasioned by external injury, or is accompanied with some other disease of the eye or its appendages, or with some constitutional derangement.

If only one eye is affected, some eminent oculists recommend the operation to be deferred so long as the patient can see distinctly with one eye, while others object to this opinion, and consider the delay of the operation very injurious, and sometimes productive of serious consequences.

It is perfectly safe to perform the operation for cataract upon young children, as early as three years old, and it ought always to be had recourse to.

The advantages of an early operation are these: when the child is very young, he is more manageable, the cataract is generally fluid, and the eye is more steady, and has none of the peculiar rolling motion, which it acquires in the course of two or three years.

The operation of couching should be thus: the patient being placed upon the floor or a low stool, and in such a situation that the rays of light may impinge obliquely upon his face, the eye not to be operated on is to be closed, while the head is reclined backwards and supported by an assistant, who sits behind on a chair, and helps to fix the eye. The surgeon now seats himself directly in front of, and considerably higher than the patient, and with the fore and middle finger of his left hand depresses the inferior eyelid; he then directs the diseased eye to be turned towards the nose, and taking the couching needle, which he holds like a writing pen, and resting his elbow upon his knee, raised to a convenient height, in order to render his hand more steady, quickly introduces the instrument through the sclerotica, about two lines from the edge of the transparent cornea, and a line basilad the transverse diameter of the eye; as soon as the needle has passed through the coats of the eye, and vitreous humour, it should be directed towards

coronal surface of the cataract, and then moved in such a manner as to depress this somewhat basilad; its point should next be cautiously conveyed in a transverse direction, between the ciliary processes and the opaque lens along the glabellar aspect of the latter, and as far as its nasal margin, care being taken not to injure the iris. The extremity of the instrument now visible through the pupil, should be directed by drawing its handle forwards away from the temple iniad and basilad, in order to sink the lens and its capsule deep in the vitreous humour; the operator recollecting to freely lacerate the latter, previous to depression.

After the operation the eyelids should be closed and covered with a piece of fine linen cloth, the patient confined to a dark room, and rest, low diet, and antiphlogistics prescribed; in three or four days, the eye may be opened and protected by a green silk shade, which, in three weeks or a month, may be laid aside.

Before commencing the operation, we ought never to neglect artificially dilating the pupil, which should be done once or twice in the course of twentyfour hours, by thickly covering the upper eyelid with a solution of the ext. belladona; the needle should be introduced as far as two lines from the border of the cornea, that it may not injure the corpus ciliare, as wounds of this very nervous and vascular part are often succeeded by great constitutional disorder, severe pain in the eye, iritis, closure of the pupil, and immobility of the iris.

The needle is entered below the transverse diameter of the eye in order that it may not wound the long ciliary artery, which runs between the sclerotic and choroid coats in a line opposite the axis of the pupil; if this vessel be punctured, it discharges its blood into the cham-

bers of the aqueous humour, conceals the iris and point of the needle, and renders the operation more embarrassing. The needle should not be withdrawn immediately after the depression of the cataract, but remain in the eye until the surgeon has ascertained that the opaque lens is permanently fixed in the vitreous humours, and then carefully withdrawn.

The whole of the crystalline capsule, but especially its glabellar layer, however perfect its transparency may be, ought invariably to be freely lacerated, and depressed, because if this be omitted, it may become opaque and form what is termed a secondary membranous cataract; adhesions of the capsules should be cautiously divided with the edge of the needle.

If the cataract be of the fluid kind, after the needle is introduced, it is only necessary to lacerate well with its point the anterior layer of the crystalline capsule; when this is effected, the fluid and milk-like lens is discharged into the anterior chamber, mixes with the aqueous fluid, and renders it so turbid as to prevent the iris and pupil from being discerned. In a short time, however, the extravasation of cloudy matter is absorbed, the aqueous humour acquires its natural clearness, the pupil presents no opacity and vision is restored.

If the cataract be a caseous one and as it is impracticable to depress this form of cataract, the front layer of the crystalline capsule should be freely lacerated, and then the substance of the discharged lens discomposed and cut in pieces, each of which should be pushed into the anterior chamber, where they are very speedily absorbed.

In cases of membranous cataract, whether it consists of the whole of the capsule of the lens, as happens in primary membranous cataract, or of the anterior or pos-

terior part, as occurs in secondary membranous cataract, in either case it should be very freely divided or broken in minute portions, all of which are to be carefully conveyed before the point of the needle into the anterior chamber, whence they are soon removed by absorption

Angularity of the pupil, or laceration of the iris are sometimes produced by pushing large pieces of cataract through the pupil.

The cases of cataract in which couching or depression should be had recourse to, are those kinds which are firm but small; in the primary and secondary membranous; on in the secondary lenticular cataract.

The preliminary steps of the operation by reclining are the same as those in couching, the opaque lens however, in reclination is dislodged in such a manner, that its coronal edge is placed iniad, its basilar one glabellad, its glabellad surface coronad, and its inial surface basilad, and instead of being carried iniad and basilad it is pushed directly iniad and lodged in the very centre of the vitreous humour. But there is another way in which reclination may be accomplished; the needle may be entered at the cornea and carried through the pupil to the opaque lens, which is to be turned backwards as before described. In this mode of performing reclination, however the surgeon has great difficulty in displacing and managing the cataract and is more liable to wound the iris, than in the other above described, where the needle is introduced through the sclerotica.

Reclination is to be preferred to couching in cases of very hard, and of several species of capsulo-lenticular cataract, and also in those examples of cataract, where the opaque lens has become adherent to the iris.

For the operation of extraction, the patient being placed on a low chair with a high perpendicular back,

and his sound eye covered with a compress, the surgeon and assistant are to be seated in the same manner as in the operation of couching, and their fore and middle finger, to keep the eyelids asunder and to fix the eye-ball; the surgeon then desires the patient to turn the eye to be operated on somewhat laterad, and taking the cataract knife which he holds like a couching needle, introduces it at the temporal side of the cornea, one eighth of a line from its connexion with the sclerotica, and one fourth of a line above its transverse diameter; he now pushes it in a horizontal direction, with its blade parallel to the iris, quite across the anterior chamber, until its point passes through the mesial side of the cornea, exactly opposite the part where it was entered. As soon as one third of the blade has emerged, all pressure must be removed from the eye, and the knife with its handle slightly lowered directed on towards the nose, in order that it may cut itself out and detach a little more than half of the cornea from the sclerotica; after the section of the cornea is completed, the superior eyelid should be allowed to fall over the eye, in order that the light may be prevented from entering it, and the pupil of course becomes expanded. In a minute or two the lid should again be elevated, and a capsule needle introduced beneath the flap of the cornea, then carefully conveyed through the pupil, and made by moving its point in various directions, to lacerate the anterior layer of the crystalline capsule; the eye must now be gently compressed, when the opaque lens is forced through the pupil, and soon escapes at the wound of the cornea. After the cataract is removed the lips of the incision are to be placed in close apposition, the eyelids brought together covered with a piece of fine linen besmeared with mild ointment, and then secured by compress and bandage.

The patient must be laid horizontally, confined to a darkened room and allowed only the sparest diet; on the seventh or eighth day the eye may be opened and defended by a green silk screen.

Puncturation is employed to express the former, section the latter part of the incision made in the transparent cornea.

When the cornea is very fat, and the iris projects considerably into the anterior chamber, the surgeon should separate with his knife, instead of more than half, about one third of the cornea, from the sclerotica, and afterwards enlarge the opening at its temporal angle, by means of a pair of blunt-pointed curved scissors, the blades of which, during their application should not be too widely extended, lest the iris be injured.

When the anterior layer of the crystalline capsule is opaque, it should be cut out in a circular form, as near to the margin of the pupil as possible, by the repeated punctures of a capsule needle, bent near its extremity; if it cannot be brought away on the point of the instrument, it should be extracted by a pair of small forceps.

The posterior layer of the crystalline capsule is to be taken away in the following manner: a tenaculum, with its point held downwards, should be carefully introduced into the eye; the opaque posterior layer and the membrana hyaloidea immediately connected to it, are to be freely divided, and then extracted with the point of this instrument, which should be directed upwards in being withdrawn.

If we fail to expel a cataract by moderate pressure, we should gently compress the lower part of the eyeball with the left fore and middle fingers, and then introduce between the pupillary margin and the inferior border of

the opaque lens, a small scoop, by means of which the cataract will be easily brought away; if the contraction of the pupil impede the expulsion of the opaque lens, it must be made to dilate by darkening the eye.

Small fragments which are sometimes broken from the surface of a soft cataract in passing through the pupil, should be removed by means of a small scoop, care being taken previous to its introduction, to gently rub the surface of the eye with the finger, which has the effect of bringing the small pieces more into view.

The capsule of a fluid cataract must on no account be punctured, and the fluid lens allowed to escape as is done in couching, but as soon as the incision in the cornea is completed, a cataract tenaculum or forceps should be introduced into the anterior chamber directed through the pupil, and then made to lay hold of the capsule, which should be drawn out along with its contained dissolved lens.

The accidents with which the operation of extraction is liable to be attended, is smallness of the opening in the cornea, prolapsus, wounds, and inflammation of the iris, escape of the vitreous humour, and ceratocele; the cause of too small an opening being made in the cornea, is by the operator in cutting this tunic, not keeping the blade of the knife parallel with the iris, but turning its edge too much forwards; its consequences are that when the incision is too small, such great pressure is used to accomplish the expulsion of the cataract, that a part of the vitreous humour is forced out and the lesser circle of iris at the same time so violently contused between the cornea and opaque lens, that either ophthalmia iridis, or closure of the pupil is produced. Whenever the corneal opening is observed to be too small it ought to be enlarged at either angle, by a pair of blunt-pointed curved

scissors carefully employed, before any other part of the operation is gone on with.

The iris becomes wounded in two ways; first, if the edge of the knife be inclined too far iniad while the operator is making the section of the cornea, the ciliary margin of the iris will be wounded; secondly, if the aqueous humour be evacuated before puncturation be completed, the basilar part of the iris will glide under the edge of the knife, and if not replaced, which may be effected by gently rubbing the surface of the eye with the point of the finger, its fibres will be more or less divided.

The loss of the vitreous humour is caused by great pressure applied to the eye either during the section of the cornea, or the extraction of the cataract; by the membrana hyaloidea being punctured with the capsule needle at the time of using it, to lacerate the crystalline capsule; or by the same delicate membrane being injured with the scoop, when employed to remove the fragments of a cataract.

Whenever the membrana hyaloidea is divided, the opaque lens, as soon as any pressure is made to expel it retreats towards the bottom of the eye, and the vitreous humours, gliding past its edges, is discharged; in this state of things, the surgeon should gently press with his left fore finger on the antinial part of the eyeball, and then introduce through the opening in the cornea a small hook, with the point of which he must lay hold of the cataract and extract it.

Ceratocele is a sort of hernia of the cornea and presents in the form of a whitish, pellucid, oval vesicle protruding between the lips of the incision made in this tunic, the lamella of which are only partially healed. It

is cured by being cut off, and afterwards keeping the eye well closed for ten days.

The operation of extraction is impracticable where the iris projects considerable into the anterior chamber, and almost touches the cornea, where the former extensively adheres to the latter tunic ; where the pupil cannot be artificially dilated in consequence of its permanent contraction, where the opaque crystalline capsule has contracted adhesions with the uvea, where the cleft between the eye-lids is extremely narrow, or, where the eyeball is deeply sunk within the orbit.

Ceratonyxis or division is thus to be performed : the patient, surgeon, and assistant being seated as in extraction, a straight spear-shaped couching needle is to be entered at the basilar part of the cornea a line and a half from its junction with the sclerotica, and then conveyed through the pupil, previously dilated with belladona as far as the crystalline capsule, which together with its contained lens must be freely divided and almost totally destroyed by moving the point of the instrument in every possible direction ; if the pupil contract during the operation, it must be made to expand by covering the eye for a short time with a dark shade.

The object of this operation is to effect a complete division of the opaque lens and its capsule so that it may be more speedily acted upon by the aqueous humour, become dissolved and then removed by absorption ; ceratonyxis is most applicable to the congenital, soft or fluid kinds of cataract; it is inadmissible in very hard, capsulo-lenticular, or spurious cataracts.

The objections to ceratonyxis consists in the very great danger there is of wounding the pupillary margin, in consequence of the iris often very suddenly contracting

as soon as the needle has arrived at the cataract; and the other in the liability that remains to the formation of secondary membranous cataract, after the operation.

The dislocation should be thus performed; the surgeon, patient and assistant being placed as in the operation of extraction, and the pupil dilated by the application of belladona. Hey's couching needle should be introduced through the sclerotica two lines iniad the cornea, and the crystalline capsule lacerated with its point; after this the instrument ought to be taken away and the lens pressed through the pupil into the anterior chamber, whence it may be extracted by making an opening in the cornea; or a couching needle, the thickness of which diminishes towards the handle, is to be pushed through the same part of the cornea as is punctured in ceratonyxis, then carried through the pupil, and its point made to freely lacerate the crystalline capsule; as soon as all the aqueous fluid is evacuated, the needle should be withdrawn, and the lens by gently compressing the eyeball, forced through the dilated pupil into the anterior chamber, whence it will be removed by absorption.

AMAUROSIS.

This is a dimness or complete loss of vision produced by a paralytic affection of the retina or optic nerve.

In amaurosis the pupil is very much dilated, more or less angular, and of its natural dark color; the iris remains immovable in the strongest light, and the power of vision is very limited, or altogether abolished; the disease sometimes appears suddenly, but for the most part steals on by degrees, seldom affects both eyes at once, and its attack is often accompanied with pain in the head, which however, gradually abates; the patient

perceives flashes of light dart across his eye, fancies that cobwebs, insects, or variously shaped small black bodies are flying before him, and often complains of a sensation as if sand were under the eye-lids; he is generally affected with a degree of strabismus, and not unfrequently loses all control over the muscles of the eyeball, so that it acquires an incessant rolling motion and cannot be accurately directed towards any object; the eye looks inanimate, horn-like and glassy, often feels distended and dry, and in some cases presents a pale gray or greenish appearance at its bottom.

The symptoms of amaurosis are very irregular; the pupil in many cases instead of continuing in a state of dilatation, contracts during exposure to intense light, and the motions of the iris are remarkable free; the patient is sometimes long-sighted, sometimes short-sighted, and often sees all the objects around him double, distorted, or of a different color from what they really possess, or imagines that they are covered with a dark mist, or thick net work. In some instances, the retina is so preternaturally sensible that a brilliant light becomes painful, in others its sensibility is diminished, and a vivid light is the most agreeable. Small bodies appearing before the eye, are termed scotomata or museæ volitantes. The cause of the white or greenish appearance at the bottom of the eye, is the diseased retina, which has become so thickened and opaque as to reflect the rays of light that fall upon it.

The reason why objects situated on one side are more distinctly discerned than those in front of the eye, is because the retina is not so much affected with opacity in any part as its centre.

The diagnostic characters of amaurosis are, there often being no opacity; the opacity when present being

situated far behind the pupil, appearing concave, of a white or greenish hue, and frequently having red streaks upon it, and never bearing an accurate proportion to the degree of loss of sight; the pupil being dilated and angular, and the eye looking dull and glassy.

Amaurosis is occasionally congenital and even hereditary; it is however more frequently produced by derangements of the chylopoietic viscera, suppressed secretions, hysteria hemorrhage, narcotic substances, ophthalmia, concussion of the head or eyeball, injuries of the supra-orbitary nerve, pressure on the optic nerve in consequence of undue determination of blood to the head, tumours within the cranium, and by a turgid state of the vessels of the choroid coat, immoderate excitement of the eye or whole system, or by disorganization of the retina or optic nerve. The individuals who are most subject to this disease are those who have black eyes; but it is not more frequently met with at one period of life than another.

Amaurosis is divided into six varieties; the comple or incomplete, inveterate or recent, continued or periodical.

The prognosis or amaurosis is to be considered favorable, when the disease is not produced by any cause likely to disturb the organization of the retina or optic nerve, when it does not entirely bereave the patient of sight, when it occurs in young people, has appeared suddenly, been of short duration, or is periodical; when it is occasioned by violent emotions of the mind, disordered stomach, the throes of parturition or convulsions; when it is attended with no pain and the pupil remains circular and of its natural dark color.

It is to be considered unfavorable when the complaint

takes place in old people, when it has been of long continuance; becomes complete or its progress been tardy; when it is accompanied with severe pain in the head or globe of the eye, or with epilepsy or convulsions; when it has been produced by violent ophthalmia, concussion of the head or eyeball, or when it depends upon a change in the organic texture of the eye. The prognosis in short, is generally unfavorable except when amaurosis is symptomatic of some other disease.

When amaurosis originates in derangement of the gastric system, the stomach and bowels should be freely and regularly unloaded by emetics and purgatives; after this, the vigor of the whole system should be increased by the exhibition of tonics, by nourishing diet and country air; and lastly the torpid condition of the retina should be removed by ammoniacal vapors directed to the eye; by blisters and stimulating embrocations applied to the temples by electricity and sternutatories; when it is produced by a plethoric state of the blood vessels of the head or eye or by external injuries of these parts, bloodletting, both general and topical, purgatives and other evacuants, cold applications on the head, and blisters to the nape of the neck should be had recourse to.

Amaurosis arising from debility of the constitution, or of the eye itself, induced by previous undue excitement, may be cured by gentle aperients, tonics, &c., and by stimulating applications to the eye.

This disease arising from fits of anger, immoderate exercise, &c., is suddenly produced, and in these cases general and local bleeding are to be employed; after which, an emetic should be administered, the bowels well emptied, and the head and eye washed with cold lotions.

Amaurosis from suppressed secretions should have these accustomed discharges restored, and then administer an emetic and purgative; periodical amaurosis is to be cured by emetics and Peruvian bark.

HEMERALOPIA.

In this disease, which depends upon a preternatura sensibility of the retina, the patient during the day, or in a bright light is not able to discern anything distinctly; but at night or in a dark shade, his vision becomes more clear; the pupil is sometimes contracted, sometimes dilated, and there is an incessant nictition.

The causes of this disease are a continued glare, sudden exposure to light after confinement in almost perfect darkness, ophthalmia, and deficiency of the pigmentum nigrum covering the tunica choroides.

The prognosis of hemeralopia may be accounted favorable when it proceeds from any of the three first causes; but unfavorable when it is occasioned by the last.

The inhabitants of hot climates, miners and old people, are most liable to this disease.

The eyes should be covered with a green shade and belladona, hyoscyamus and other sedatives employed both internally and externally. If there be any inflammation the antiphlogistic must precede the sedative plan.

NYCTALOPIA.

In this disease, the vision at night is very feeble and dim; but during the day, or in a strong light perfectly distinct. This disease is produced by long exposure to a dazzling light. Nyctalopia is sometimes periodical and not unfrequently endemic.

It will be relieved by the application of blisters to the temples, and ammoniacal or other stimulating vapors, and vin opii to the eye; in the intermittent form, these means should be conjoined with bark.

CANCER OF THE EYE.

In the beginning of the most common form of this disease, the eye is affected with burning heat and inflammation, and in a short time after becomes swollen, then grows hard and knobby, and of a purple color from enlargement and a varicose state of the vessels of the albuginea; all power of vision is destroyed, the enormous eyeball soon protrudes from the socket, has a flesh-like appearance, is extremely painful, occasions the most excruciating head-ache, and, by its pressure, renders the bones of the orbit carious; if it should ulcerate, which it not unfrequently does, the ulcerated surface becomes exquisitely sensible, discharges an offensive sanies, and sometimes alarming quantities of blood; the glands about the angle of the jaw, and along the neck, enlarge and inflame; the constitution at length sinks under the excessive and continual irritation, and the patient is destroyed.

Cancer of the eye sometimes commences in a malignant ulcer situated on the surface of the eyeball, or upon one of the eyelids; and sometimes in a small excrescence growing from the transparent cornea, which, although apparently harmless at first, yet, after being cut off, returns, and ultimately becomes cancerous.

Cancer of the eye generally occurs in those who are in the decline of life. Violent contusions of the eyeball and constitutional diseases are its causes, though it sometimes comes without any obvious cause.

The only remedy is extirpation of the eye, which operation is generally successful when employed in the very commencement of the disease, and when this is entirely confined to the globe of the eye; but it only tends to accelerate the patient's dissolution when had recourse to in the latter stages of the complaint, when the brain and surrounding parts have become tainted, and the bones of the orbit carious; the cancerous affection, however, sometimes reappears in the orbit after every morbid part has apparently been removed.

FUNGUS HÆMATODES OF THE EYE.

This commences with dimness of vision and slight inflammation of the conjunctiva; the iris becomes motionless, and the pupil unalterable in every degree of light; a white amber or green colored substance is observed at the very bottom of the eye, which gradually increases in size, and advances towards the cornea; in its progress it obliterates both the chambers, and fills up the pupil; the eyeball now loses its natural spherical figure, becomes nobby, of a livid color, excessively painful, and protuberates from the orbit; the headache is intolerable, and sight completely abolished; in a short time the transparent cornea ulcerates, and through the ulcerated aperture a dark purple fungous tumour projects, which discharges a thin fœtid matter, often bleeds profusely, frequently mortifies and drops off, but again speedily springs up; sometimes this fungus bursts through the sclerotica, and then pushes the eyeball from the socket; in the last stage of fungus hœmatodes of the eye, the lymphatic glands of the neck become contaminated, inflame, and ulcerate; great constitutional irritation is excited, and this sooner or later destroys the patient.

External violence, or constitutional disorder are the causes of this disease. It seldom affects both eyes at once. The parts of the eye first affected in this disease are the retina and optic nerve. The green or yellow appearance observable at the bottom of the eye, is the surface of the retina, which, in fungus hæmatodes of the eye, loses its original hue, becomes opaque, and swells into a tumour of a medullary structure.

The brain and its membranes present, on dissection, purple colored spots, which are sometimes observed on the dura mater, or a number of white tumours containing a thick fluid, on the membrana arachnoides and pia mater; and one or both of the thalami nervorum opticorum are found disorganized and changed into a bloody pulpy mass.

Fungus hæmatodes is to be distinguished from cancer of the eye by the former commencing in the central parts of the eye, is commonly incident to youth and more destructive than the latter, which generally occurs in old age, and always makes its first appearance on the conjuntiva or peripheral parts of the eyeball; in fungus hæmatodes, the diseased eye is extremely soft, in cancer peculiarly firm.

In fungus of the eye, there should be extirpation of the organ, this being the only remedy, and even this is often unvailing, however early it is had recourse to; if deferred until the last stage of the complaint, it then never fails to shorten the patient's life.

In the operation of extirpation of the eye, the patient being laid upon his back and the eyelids held asunder, a free incision is to be made at their temporal commissure, and the conjunctive tunic divided all round just where it begins to be reflected over the surface of the eyeball; the surgeon then introduces through the tumour a hook

or ligature, with which he draws it aside in any direction, and proceeding from the lateral towards the mesial canthus, dissects the eyeball from the socket, dividing first its coronal and then its basilar attachments, and lastly the optic nerve, and origin of the muscles of the eye. When the eye is removed the orbit must be carefully examined, and all indurated and suspicious parts cut away; a piece of sponge should be inserted to repress the hemorrhage, and the eyelids closed and covered with a compress and bandage; in a day or two the sponge should be withdrawn, a poultice applied, and inflammation obviated by the usual means.

DISEASES OF THE EAR.

The principal diseases of the meatus auditorius externus are inflammation, congenital or accidental imperforation, obstruction of foreign bodies, or indurated cerumen, excessive secretion of cerumen, polypi or other excrescences, and herpetic ulceration.

In inflammation of the meatus auditorius externus, the patient complains of excruciating pain in the ear, preceded by great tenderness upon pressure; the pain extends to the head, face and neck; the lining membrane of the meatus looks red, and in a short time becomes so swollen as completely to shut up the passage and occasion considerable deafness. These symptoms are generally attended with fever, and sometimes delirium.

Cold, severe blows on the ear, extraneous irritating substances lodging within the canal, &c. are the causes

of this affection. It commonly either terminates in resolution or suppuration; the discharge in the latter instance being thick, yellowish, and for the most part fetid.

In its onset, leeches, warm anodyne fomentations and emollient poultices should be frequently applied to the ear, and blisters to the nape of the neck; purgatives should be freely administered, and quietude and low diet prescribed. In the suppurative stage a ready exit for the puriform matter must be made and the auditory canal frequently washed out by the injection of warm liquids, and carefully protected from cold. If the discharge becomes chronic, it must be suppressed by the use of astringent injections.

When imperforations of the external auditory passage is occasioned by a thin membrane, this should be divided by a crucial incision, and a spunge tent introduced through the opening to keep it sufficiently dilated; the flaps ought to be cut away if possible, which can always be effected when the obstruction is situated near the outer orifice of the canal.

When the obstruction lies very near the membrana tympani, it should be destroyed by the application of caustic, as it would be almost impossible if we employ a knife, to avoid wounding the membrane of the tympanum, and if even this did escape a tent could not be inserted to obviate the reunion of the divided parts.

When the meatus auditorius externus is nearly or altogether obliterated, a trocar of about the same length as the passage, should be pushed quite through the obliterated part, and then a tent introduced to prevent adhesion of the sides of the opening, and to preserve its proper diameter.

When the meatus auditorius externus is preternatu-

rally contracted, and if it depend upon a thickening of the soft parts, this should be removed by the application of escharotics, or the passage gradually dilated by inserting into it firm sponge tents; if it be the result of malformation of the bone, it is incurable.

Insects and other foreign bodies are to be extracted from the ear in the following manner: the patient being placed on a low seat, and in the direct rays of the sun, the surgeon raises the auricula coronad and iniad, in order to render the external meatus straight, and allow the light to pass to its mesial extremity; he then introduces a pair of very slender forceps, and extracts the exotic body.

If we fail in removing a live insect in this way, almond oil should be dropped into the external auditory tube, so as to suffocate the animal which may then be washed out by the forcible injection of warm water.

The removal of hardened cerumen is to be accomplished by repeatedly and with a tolerable degree of force injecting six or seven ounces of warm water at once into the external meatus. When the secretion of cerumen becomes excessive it is to be checked by the frequent injection of astringents, as decoction of oak bark, solutions of the ext. kino, or of the sulphate of zinc.

Polypi or other excrescences are to be removed from the external meatus, if they be firm and have a narrow base by ligature; if soft and the base be broad, they should be destroyed by forceps and nit. argent. When they are situated near the lateral opening of the tube, they are easily cut away with a bistory.

Herpes of the meatus auditorius externus is to be cured by the injection of solution of sulph. zinci and oxymur. hyd. and the ung. nit. hyd.; with the internal remedies of small doses of pil. hyd. and gentle aperients,

administered in order to remove the deranged state of the digestive organs, upon which this affection commonly depends.

The chief diseases of the tympanum are inflammation, preternatural relaxation or tension of the membrana tympani, and obstruction of the eustachian tube.

The symptoms of inflammation of the tympanum are agonizing throbbing pain in the ear, accompanied with severe head-ache, deafness, a sensation of roughness about the guttural aperture of the eustachian tube, fever and delirium. The inflammation sometimes extends to the brain, and occasions death; if it terminates in resolution the symptoms gradually subside and the hearing returns; if in suppuration, which it usually does, the membrana tympani ulcerates, the bones of the ear are discharged along with the offensive ichorous matter, fungous excrescences spring up in the external meatus, and the patient remains permanently deaf.

The causes of this affection are cold, or inflammation of the fauces, especially that which occurs in scarlatina maligna, spreading along the eustachian tube into the tympanal cavity.

It is to be treated by venesection, purgatives, anodyne fomentations and other antiphlogistic means; the discharge must be restrained by astringents, and the excrescences destroyed by forceps and caustics.

The symptom which indicates relaxation of the membrana tympani, is deafness, which grows worse during wet hazy weather, but is relieved in dry weather; its treatment consists in the use of blisters, stimulating and astringent applications.

The undue tension of the membrana tympani is indicated by the hearing being so very acute, particularly in damp weather, that the lowest whisperings are sometimes intol-

erable ; it is relieved by dry weather, purgatives, anodyne applications and blisters.

Obstruction of the eustachian tube is sometimes a congenital affection, but more commonly depends upon inflammation and intumescence of its lining membrane ; an accumulation of thickened mucus the result of inflammation ; the cicatrices of syphilitic or other ulcers in the throat ; enlarged tonsils, or nasal polypi descending into the pharynx.

The indications by which we conclude whether deafness arises from obstruction of the eustachian or not, is by the external meatus being discovered to be in a healthy and natural condition, when the patient can distinctly hear the sound of a watch placed between his incisor teeth, when no crackling and sense of fulness are perceived in the ear on forcibly blowing the nose, when the deafness has succeeded some inflammation or ulceration of the fauces, when these appear malformed or the tonsils enlarged.

Obstruction of the eustachian tube produces deafness in this way ; the use of the eustachian tube is to convey atmospheric air from the mouth into the tympanal cavity, which requires to be constantly filled with the elastic fluid in order that the sense of hearing may be perfect ; when this tube is obstructed, deafness of course ensues ; which can only be removed, either by destroying the obstruction or puncturing the membrana tympani, and allowing the air to enter the tympanum from the external meatus.

When obstruction of the eustachian tube depends upon a collection of viscid mucus, it may be removed by the injection of warm water ; when it is permanent it is irremediable, and the deafness which it occasions can only be relieved by puncturing the membrana tympani.

We conclude that the obstruction is permanent when it is congenital, or consequent to extensive ulceration of the fauces; and temporary, when it has been produced by a common cold.

The mode of injecting the eustachian tube is this: after the patient is placed upon a low seat, and his head reclined backwards, a slender silver tube somewhat curved towards its extremity, should be passed along the floor of the nostril, with its convexity directed coronad; as soon as it has reached the posterior nares, the convex part must be turned towards the septem nasi, and its point gently pushed into the mouth of the eustachian tube. Warm water is then to be frequently injected by means of Anel's syringe.

The operation of puncturing the membrana tympani is this: the patient being seated in a clear light, and the auricula pulled coranad by an assistant, a small trocar is to be introduced along the external auditory passage, and carefully pushed through the membrana tympani at its antinial part; as soon as the instrument has entered the tympanum, it must be twirled between the finger and thumb in order to lacerate the fibres of the membrane, and thus prevent the puncture from healing up.

The circumstances in which this operation is sometimes rendered unsuccessful is from the perforation being made too small and soon closing again, by its being made too large and the malleus displaced, by the lining membrane of the tympanum being wounded and becoming inflamed and ulcerated, or by the deafness arising from other causes besides obstruction of the eustachian tube.

The diseases of the labyrinth or internal ear are malformation, inflammation of its lining membrane, extraneous matter contained in it, deficiency or complete

loss of the liquor cotunni, and insensibility of the auditory nerve.

The symptoms of deafness arising from loss of sensibility in the auditory, is the secretion of cerumen being diminished, the patient's complaining of various noises in the ear, and is nearly or altogether insensible to the ticking of a watch put between his teeth, or to the side of his head.

Tumours pressing upon the auditory nerve, are the causes of its insensibility — or it may proceed from lesions of the brain, determination of blood to the head, disordered state of the chylopoietic viscera, fevers and exposure to loud sounds.

When nervous deafness arises from the three first causes it is generally incurable; when it depends upon a plethoric state of the blood-vessels of the brain, bleeding both general and topical, purgatives, low diet, blisters and cold applications to the head, should be had recourse to; when upon derangement of the digestive organs pil. hyd., gentle purgatives, bitters, exercise and nutrient diet, are to be prescribed; when it is produced by intense sound, or other causes inducing atony of the auditory nerve, blisters should be applied behind the ear, and ether dropped into the external meatus audit; electricity and galvanism are also to be employed.

DISEASES OF THE NOSE.

The principal surgical diseases of the nose are hemorrhage, polypus and ozæna.

Epistaxis or nasal hemorrhage, is generally preceded by itching in the nostrils, pain, heaviness or sense of fulness in the head, flushing of the face, throbbing of the temples, ringing in the ears, quick pulse, and sometimes universal shiverings.

The causes of epistaxis are insolation, coughing, violent muscular exertion, various emotions of the mind, &c., blows upon the nose or forehead, and in peculiar idiosyncrasies, smelling at pungent or odoriferous substances. If the hemorrhage is profuse, or occurs frequently in debilitated or aged people, it is attended with danger.

Sometimes epistaxis proves beneficial, and requires caution in attempts to suppress it, as when it occurs in young, vigorous and plethoric individuals; when it seems to prevent a fit of apoplexy, epilepsy or mania, or to terminate an attack of inflammation of the brain; this hemorrhage is to be suppressed by placing the patient erect and in a cool situation, keeping the head constantly wet with cold evaporating lotions, and introducing astringents or tents covered with powdered charcoal into the nostrils; if the hemorrhage be of the active kind, and connected with a plethoric state of the system, bleeding from the arm or temples will be necessary.

If these means fail to check it, a piece of waxed silk must be conveyed, by means of a slender probe, through the bleeding nostril into the fauces, and then by a pair of forceps brought out at the mouth; to the extremity of the ligature a dossil of lint must be fixed, which after being carried on the point of the finger towards the velum of the palate, should be drawn up into the posterior nares; the anterior nostril should also be plugged up with lint; as soon as the hemorrhage has ceased, the tents are to be withdrawn.

NASAL POLYPUS.

This is a pyramidal-like, fleshy excrescence, generally situated near the root of the nose, and arising by one or more roots from the schneiderian membrane; in its commencement it is seldom attended with pain; as it increases in size, it gradually descends into the fauces or nostrils, affects the speech, impedes respiration and swallowing, and destroys the smell; after a short time it compresses the lachrymal sac, and closes up the mouth of the eustachian tube, in consequence of which the eye becomes watery and the hearing diminished; the tumour at length enlarges to such an extent as to occasion the most violent headache, stupor, and a dreadful feeling of distension; the nose is swollen and displaced, and the whole countenance turgescent and distorted; from the extreme pressure, the bones composing the nasal cavity become carious, a fœtid, ichorous, bloody matter, flows from the nostrils, excessive and repeated hemorrhages come on, and the patient expires.

There are two kinds of polypus, the soft and the firm.

The first kind are of a pale red color, never affected with pain, not even when handled; compressible, easily broken, and discharge a transparent lymph; their size diminishes, and they are retracted within the nostril during dry weather, but become elongated during damp weather; they are not attended with danger, but owing to their obstructing breathing and deglutition, create great inconvenience.

The firm polypus is very vascular, of a deep red color, very painful from its first commencement, incompressible, tough, not affected by changes in the weather, often attended with caries of the nasal bones, and an offensive

discharge from the nostrils; is very apt to return after removal, or to become cancerous.

The causes of polypi, are repeated attacks of catarrh, local injuries, a morbid state of the constitution, and relaxation of the mucus membrane of the nostrils.

The soft kind of polypi, which depends principally upon a relaxed state of the schneiderian membrane, may in the early stage be impeded in its growth, or even dispersed, by astringent injections and solution of muriate of ammonia; but when it has increased to a large size, it requires as well as the firm polypus, an operation for its removal.

There are four modes of destroying nasal polypi — extraction, ligature, excision and caustic.

There are circumstances under which the extirpation of a nasal polypus would be dangerous, as when the polypus is of a firm or scirrhus kind, and attended with severe headache; when it occasions great pain during coughing or sneezing, bleeds profusely, or becomes painful when slightly touched, or occupies a large extent of the nasal lining; when a probe cannot easily be passed round its lower part for some height up within the nostril, and when it discharges a fœtid and bloody matter.

An operation is most easily accomplished, and is most successful, when performed on a soft polypus.

The operation of extraction should be thus: — The patient being seated, and his head reclined backwards, the polypus must be propelled down into the nostril, by closing the mouth and forcibly blowing the nose; it should then be separated as much as possible from its adhesions, by means of a thin, flexible spatula, and after this is withdrawn, firmly grasped by a pair of polypus forceps, and twisted from its root. As soon as the opera-

tion is performed, the nostrils should be examined, and if another polypus be discovered, it ought immediately to be extirpated. If bleeding follow the extraction of the tumour, it must be suppressed by the means already recommended for nasal hemorrhage.

If the polypus break under the blades of the forceps, and only a portion of it be extracted, the hemorrhage which occurs in such a case, and often proves dangerous, must be checked by immediately again laying hold of the tumour, and twisting it from its attachment.

If the polypus hang more into the throat than the nostril, it should be grasped by a pair of curved forceps, conveyed along the mouth, and behind the veil of the palate, and then pulled away as close to its root as possible. If the polypus project equally into both the fauces and nostril, the nasal portion should be first removed.

The dangers attending the operation of extraction, are hemorrhage and inflammation ; and when the operation is not dexterously performed, the delicate nasal portion of the ethmoid bone may be brought away, or large pieces of the schneiderian membrane detached. Extraction is most applicable to the soft kind of polypus.

The ligature is to be applied in this manner : — After the patient is seated and the polypus detached from its adhesions, a silver wire should be passed round its root, and then drawn tight ; by the constriction, the tumour at first is rendered very painful and inflames ; at length it mortifies and drops off.

The ligature is best adapted to the firm polypi, particularly when these project into the fauces ; it is difficult of application, and frequently occasions extensive inflammation of the nasal cavity, ear and throat, accompanied with violent symptomatic fever.

For the operation of excision, the patient should be placed as for extraction, and the polypus brought down as low as possible, a blunt, curved, or sheathed knife must be introduced high up the nose; and then made to detach the tumour close to the root.

The hemorrhage, which generally happens after excision, should be restrained by the usual means.

In applying the caustic after the patient is seated, the polypus should be laid hold of, and in some degree squeezed and contused by the blades of a pair of forceps; the blood and mucus should then be wiped away from the nostril, and a caustic bougie introduced and applied every second day until the tumour is quite destroyed.

To the small and soft species of polypus the caustic should be employed. The actual cautery is the best method of destroying nasal polypi that are most disposed to bleed.

OZÆNA.

This is an ulcer of a malignant character, situated within the nose; it commences with slight inflammation about the olæ nasi, accompanied with sneezing, increased flow of mucus, and sometimes hemorrhage from the nostrils; the ulceration soon spreads from the schneiderian membrane to the nasal cartilages, and if not checked, affects the bones; a thin offensive matter which excoriates the lips and throat, is then constantly discharged from the diseased parts, and the sense of smell abolished; at length the inferior spongy bone and the vomer, and sometimes with these the palate and superior maxillary bones exfoliate, the cavity of the nose falls in, and the countenance is hideously deformed.

Ozæna is caused by a scrophulous or syphilitic state of the system.

The surgeon should, in the treatment of ozæna, first have recourse to warm fomentations and poultices in order to reduce the inflammation; he should then apply to the ulcer solutions of oxymur. hyd. sulph. cupri, or nit. argent. diluted sulphuric acid and ung. hyd. nit. oxyd. and insert lint up the nostril, to absorb the discharge; during the employment of these local remedies, he should give preparations of mercury in conjuction with antimony, nitric acid, cinchona, and light nutricious diet.

DISEASES OF THE ANTRUM.

These may be abcesses, various kinds of tumours, insects and foreign bodies lodged in it.

The symptoms of abcess of the antrum are its beginning with severe pain in the cheek, which is often mistaken for toothache, and extends to the nose, eye and forehead; in a short time the cheek becomes swollen, red, extremely hard and tender to the touch; when the head is laid on the sound side, pus is generally discharged at the nostril: the cheek at last ulcerates, the molares becomes loose and drop from their sockets; if a free exit for the matter be not obtained, the walls of the antrum grow carious, and the breath is rendered intolerably offensive.

Blows upon the cheek, protrusions of the fangs of the teeth into the antrum, caries of the teeth, inflammation of the nostrils, and perhaps obstruction of the natural opening of the sinus into the nose are the causes.

An opening should be made into the antrum, and the matter evacuated as soon as possible, and this may be effected by first extracting the third or fourth molar tooth, and then pushing a curved troca through the apex of the socket; after the purulent fluid is discharged, warm water should be injected into the antrum, and when the inflammation has subsided, a solution of sulp. zinci or lime water must be employed in its stead. To prevent the food from entering the sinus, a piece of sponge tent must be introduced into the artificial opening.

TUMOURS IN THE ANTRUM.

These are known by the patient's complaining of pain in the cheek, which gradually becomes more violent, and is at length succeeded by a sense of fulness in the face; as the tumour enlarges, the sides of the antrum are pushed out in all directions; the nostril of the affected side is filled up, and excessive hemorrhage frequently take place from it; the cheek becomes swollen and excoriated by the tears flowing over it, the orbitar plate of the superior maxillary bone is raised up and the eyeball made to project from the orbit; the roof of the mouth is depressed towards the tongue, the molares are dislodged and the fungi spring up through their sockets; the whole countenance grows deformed, caries at last affects the bones, an offensive matter is discharged from the nostrils, the constitution sinks under the excessive pain and irritation, and the patient dies a miserable death.

Tumours of the antrum are to be removed in the following manner:— A longitudinal incision extending from half an inch below the edge of the orbit to the commisure of the lips, should be made completely through the skin and muscles of the face down to the bone; the

soft parts should next be dissected back, and when the surface of the glabellar or anterior wall of the antrum is fairly exposed, a portion of it must be cut out by the crown of a trephine; the tumour should then be removed with a scalpel, after which the cavity of the sinus ought to be well seared with the actual cautery, which has the effect of preventing hemorrhage and a recurrence of the disease.

DISEASES OF THE LIPS.

The principal of these are malformation or hare-lip, excrescences, ulcers, and cancers.

A hare-lip is when either one or both are divided by a fissure, which is generally longitudinal, and in a line with the septem nasi; occasionally it is opposite one of the nostrils, sometimes even continued into this part, and then the alæ nasi of the affected side is expanded, and appears much flatter than its fellow; in some instances there are two fissures, having a small lobe of the lip hanging between them; articulation for the most part is very indistinct, and the process of sucking performed with difficulty.

A division of the bones, and other parts composing the palate, occasionally accompanies hare-lip, principally the double kind, and in some examples extends as far as the uvula; when the palate is cleft, there is generally a projection of the alveolar process of the superior maxillary bone, and of one or two of the incisor teeth.

Hare-lip consists merely in a division, not in a deficiency of the parts composing the lip; this affection

most commonly appears in the upper lip, as it very rarely occurs in the lower, except as the result of accident.

The operation for hare-lip is this:—The patient being seated on a low chair, and the projecting teeth carefully extracted, his head must be reclined on the breast of an assistant, who stands behind, pushes forwards the cheeks, and at the same time compresses with his fingers the facial artery on each side, as it mounts over the edge of the lower jaw; the surgeon then stretches the lip on a piece of thin wood, and with a scalpel cuts off the edges of the fissure, thus:
He next brings the bleeding surfaces together, and accurately uniting them by the interrupted or twisted suture passed more than two thirds through the thickness of the lip, secures the whole by compress and bandage.

The projecting alveolar process should not be removed, because after the fissure is united, the projection gradually diminishes, and if the operation be performed when the patient is very young, even the cleft in the palate also closes up. The red part of the divided lip should first be brought into contact; the coronary artery, which is a branch sent off at the angle of the mouth, from the facial, is divided in this operation.

This operation, when performed on young infants, is sometimes followed by dangerous results, as convulsions, &c.

The treatment of tumours and ulcers of the lips, should be by the former being removed by excision, ligature, or caustic; the latter, as they depend upon a different cause, require a different course of treatment; when produced by the constant irritation of a rough or carious tooth, it should be extracted or filed down; when arising from a less obvious cause, or from a faulty state of the constitu-

tion, cicuta and arsenical preparations, in conjunction sometimes with aperients or opium, are the best remedies.

CANCER OF THE LIP.

This commences with a small ulcer, which at first appears benign, but afterwards assumes a malignant character, and ultimately extends over and destroys the whole lip; sometimes it begins in the form of a small pimple or wart-like excrescence; this, after remaining indolent perhaps for years, at length, owing to some irritating cause, grows painful and then ulcerates; the ulcer spreads wider and wider, its edges are indurated, and it discharges in great abundance a dark colored fetid matter; if not extirpated, it consumes the whole lip, the saliva involuntarily escapes from the mouth and excoriates the chin, the glands of the neck become swollen, and the patient presents a most shocking spectacle.

Cancer of the lip should be removed by an operation similar to that for hare-lip; a triangular portion of the lip, including the whole of the disease, must be cut away, the edges of the wound brought into accurate contact, and then secured by ligature, or the twisted suture; if the glands of the neck be contaminated, the operation generally proves unavailing.

If the cancerous affection extend over the whole lip, it should be dissected away by an incision of a semilunar form, extending the whole length of the lip, and the wound healed by granulations.

DISEASES OF THE TONGUE.

These are, a preternatural enlargement, wounds, inflammation, tumours, ulcers, cancer, adhesion to the bottom of the mouth, and malformation of the fœnum.

In preternatural enlargement of the tongue, if it interfere much with mastication, deglutition or speech, a portion of the enlarged organ must be cut away, and the vessels tied; if it occasion but little inconvenience, an operation will be unnecessary.

Wounds of the tongue, if deep, should be closed by a suture, the tongue kept still, the lower jaw secured by a bandage, and the patient fed upon liquids. These wounds are for the most part produced by the teeth, generally transverse, and situated nearer the apex than root.

Inflammation of the tongue is usually attended with such enormous swelling, that the patient is incapable of speaking and swallowing, and sometimes even of breathing; it should be relieved by making two or more longitudinal incisions along the dorsum of the tongue; by opening one or both of the ranine veins, if this be practicable, and by applying leeches and blisters to the throat. If the inflammation terminate in suppuration, the mouth must be frequently washed with demulcent fluids, while the throat is kept constantly covered with warm emollient poultices; if in mortification, it must be treated agreeable to the method already recommended.

The causes of the inflammation are, foreign bodies lodging in the tongue, and salivation, wounds, &c.

Tumours of the tongue are to be removed thus:— The patient being seated and his head secured, the

tumour must be laid hold of by a tenaculum, and then dissected out with a scalpel.

The friction of a rough or projecting tooth, derangement of the chylopoietic viscera, syphilis, improper use of mercury, &c., are the causes of ulcers on the tongue.

When the cause is considered, the treatment will be apparent; opium exhibited in large quantities, has sometimes succeeded in healing ulcerations of the tongue, where every other measure has failed.

Cancer of the tongue first presents itself in the form of a small scirrhus tumour, or of several minute hard tubercles situated near the edge or apex of the tongue; these become painful and at length break out into ulcers which are surrounded by a hard dark colored base and discharge an offensive sanies; in the progress of the complaint the lymphatic glands of the neck are affected and inflame.

This disease is to be extirpated either by ligature, excision, or the actual or potential cautery. The first is applied by passing through the tongue a needle armed with a double ligature, a part of which must be made to include each side of the diseased mass.

For the operation of excision the patient being seated on a chair, and his mouth kept open by a piece of wood put between the molar teeth, the surgeon seizes the tongue with a pair of forceps or a tenaculum and pulling it forwards cuts the cancerous portion by means of a scalpel; he then ties the vessels or restrains the hemorrhage by the application of the actual cautery; after the operation, the tongue must be moved, and the patient desired to live on liquid food.

DIVISION OF THE FRÆNUM LINGUÆ.

Sometimes the fænum linguæ is continued to the very extremity of the tongue, the motions of which are thereby greatly limited; sometimes it is too short, confining the organ to the bottom of the mouth, in both cases, it ought to be carefully divided by a pair of blunt pointed scissors.

The ranine arteries and veins may be wounded; in this operation; and dangerous, if not fatal hemorrhage ensue; should the fænum be too extensively divided the tongue may fall backwards into the throat and cause suffocation; the hemorrhage from the raninal vessels is to be checked in the following manner; the surgeon takes a rounded piece of whalebone of a proper length and splits it to the extent of eight or ten lines; he then separates each side a little asunder so as to form two prongs, and give the whole the appearance of a common hay-fork; having wrapped it well round with soft linen in order to prevent any injurious consequences arising from its pressure and to obviate its further division he places it beneath the tongue with the prongs resting on each side of the frænum while the handle is supported against the middle of the inial or posterior surface of the lower jaw; he then secures the tongue by a bandage passed over its dorsum, crossed under the chin and tied round the neck. By this contrivance the blood-vessels are compressed and the hemorrhage checked.

If this plan prove ineffectual the lingual artery should be exposed and tied where it passes over the corner of the os hyoides. The tongue is to be prevented from falling backwards into the pharynx by means of a firm com-

press, formed of a piece of thin wood thickly covered with soft lint.

RANULA.

This is a bluish colored tumour, of a round or oblong figure, situated beneath the tongue, and caused by an enlargement of the ducts either of the sublingual or submaxillary glands; it varies considerably in magnitude; when small it is attended with no pain and little inconvenience; but when it acquires a large size; it increases the salivary secretion, raises up the tongue, turns its apex backwards, and impedes deglutition and speech and in some cases, by its pressure, forces out the teeth and destroys the lower jaw; it contains either a ropy transparent fluid, imperfectly formed pus, or earthy matter.

Ranula depends upon an obstruction of the mouth of the salivary duct, produced either by congenital imperforation, adhesion, or a collection of viscid saliva or calcareous matter.

If the tumour be small it should be opened by a free transverse incision, if large it will be necessary to cut out the whole of its anterior part with a pair of scissors; its contents ought then to be evacuated, and the obstruction removed from the duct by means of a small probe or the repeated injection of warm water. Ranula sometimes bursts spontaneously and a cure is produced.

DISEASES OF THE TONSILS AND UVULA.

These are inflammation and its consequences, chronic enlargement, calculous substances contained in them.

Inflammation of the tonsils is characterised by redness and swelling of these parts, accompanied with extreme pain in swallowing, difficulty of speech and respiration, dryness of the throat, thirst, foul tongue, flushed countenance, headache, deafness and fever.

The treatment of cynanche tonsillaris consists in scarifying the inflamed tonsils, in the employment of general and topical blood-letting, emetics, purgatives, and diaphoretics, and in the use of gargles and of blisters and rubefacients to the throat. If these means fail to afford relief and suffocation be threatened bronchotomy should be had recourse to without delay.

When suppuration takes place, the vapor of hot water should be frequently inhaled, warm emollient poultices applied to the neck and an early incision made into the abscess for the discharge of purulent matter.

Enlarged tonsils are to be removed by means of ligature or excision. In applying the ligature, if the projecting tonsil have a slender base, a piece of fine silver wire should be conveyed through the nostril into the throat and then put around the tumour by a pair of forceps; this being effected the ends of the ligature are next to be passed through a double canula, which should several times be twisted in order to render the noose effectually constrictive. If the enlarged tonsil have a broad base, a double ligature must be introduced through its middle by means of a long needle; this being with-

drawn, the ligature must be divided and a part of it carried round the upper and under portion of the swelling.

For excision the patient must be seated with his mouth kept open by a piece of wood or iron placed between the molar teeth; the surgeon then lays hold of the enlarged tonsil with a proper tenaculum, and drawing it forward from its situation removes, by means of a scalpel, as much of its projecting part as he conceives necessary. The hemorrhage should be checked by cold astringents, gargles, or the application of the actual cautery.

If the surgeon incautiously plunge his knife too deep into the substance of the diseased tonsil he runs great risk of wounding the external carotid artery, which is situated immediately behind the gland. When the uvula is elongated it excites coughing, vomiting, and a constant inclination to swallow by its coming in contact with the epiglottis and surface of the tongue.

For the removal of the elongated portion of the uvula it should be taken hold of by a pair of long slender forceps and cut away with scissors.

DISEASES OF THE NECK AND THROAT.

WRYNECK.

In this disease the head is bent obliquely towards either the right or left side; the face is generally turned from the shoulder, towards which the head is drawn and the neck on the contracted side is harder and more bulky than the opposite one.

It is occasioned by a spasmodic affection of one of the

sterno-cleido-mastoidei muscles; by a permanent contraction arising from a difference in the length of these muscles; by a contracted state of the platysma myoides; by large cicatrices in the integuments of the neck; by paralysis of the flexor muscles on one side of the neck, and by distortion of the cervical vertebræ.

When the disease depends upon spasm of one of the mastoid muscles, which is generally produced by inflammation or a violent strain, recourse should be had to friction, stimulating embrocations, antispasmodics and aperients; when it arises from a permanent contraction of these muscles on either side of the neck caused by an inequality of their length, it can only be remedied by an operation, which consists in dividing the contracted fibres.

The mode of performing the operation is this — the patient being laid on a table, a transverse incision is to be made through the skin and platysma-myoides, so as to expose the clavicular portion of the mastoid muscle, which after passing a director under, it should be divided by a probe, pointed bistory; if necessary the sternal portion must also be divided in the same manner; after the operation the head should be drawn into a straight position by some mechanical contrivance: it is sometimes necessary to cut out a portion of the mastoid muscle in certain inveterate cases.

In those examples of wryneck depending upon contraction of the platysma myoides or upon cicatrices of the skin, the contracted parts should be cautiously divided or removed and the head brought into and preserved in an erect posture by a well adjusted apparatus.

Wryneck arising from paralysis may be cured by the application of electricity, cold water, blisters and other stimulating and tonic applications to the paralysed muscles, and by keeping the head in a straight position.

Distortion of the cervical vertebræ may be relieved, if the bones be in a sound condition, by proper mechanical means.

BRONCHOCELE.

This is an enlargement of part of the whole thyroid gland. The swelling at its commencement is smooth, soft, elastic, and unattended with pain or discoloration of the skin; after it has existed some time it generally becomes irregular and acquires considerable hardness; sometimes it increases to such a prodigious magnitude as greatly to deform the countenance, and produce impeded respiration, hoarse voice, violent head-ache, and a varicose state of the subcutaneous veins of the neck.

Bronchocele most commonly occurs about the age of puberty; it occasionally, however, makes its first appearance at the more advanced periods of life. It more frequently attacks females than males, particularly those that are delicate. Bronchocele may be mistaken for aneurism or abscess.

The internal structure of the diseased thyroid when examined is found to consist of a number of oval cells varying in size, and containing sometimes a transparent viscid fluid, sometimes a solid substance.

The causes of bronchocele are cretinism, innutritive diet, and a scrofulous state of the constitution. Bronchocele is endemic in some countries.

The local remedies are frequent and long continued friction, leeches, blisters, an ointment composed of iodine and mercurial plasters; the general remedies are purgatives, pil. hyd., calom., muriate of barytes, muriate of lime, burnt sponge; or iodine given in doses of half a grain, three times a day.

If these means prove ineffectual in dispersing the disease, and if the tumour be very large and seriously affect the breathing, occasion much inconvenience, or pain, it ought to be extirpated; in doing which the surgeon should remember to make his first incision through the integuments, of sufficient extent to allow the subsequent dissection to be performed with greater facility; he should also be careful to tie each artery, as soon as divided, and above all to avoid injuring the numerous important parts with which the thyroid gland is surrounded.

If extirpation of the thyroid gland cannot be accomplished, we should, in this case, intercept the supply of blood to the swelling by tying the superior thyroideal arteries, which may be effected by making a suitable incision through the skin and platysma myoides at the mesial edge of the mastoid muscle, exposing the vessels and then passing a firm ligature round them; the operation is most applicable in aneurismal bronchoceles in which cases it is generally followed by a considerable diminution in the size of the tumour; it is not however unattended with danger.

FOREIGN BODIES IN THE ŒSOPHAGUS.

They are most commonly found situated in the isthmus faucium, or upper part of the pharynx; if they pass beyond this point, they rest at the superior or inferior orifice of the œsophagus generally at the latter, and rarely at the middle part of the tube.

The dangerous consequences arising from the detention of foreign bodies in the pharynx is, if they be small, occasioning difficulty of breathing, pain and inflammation;

if large, they produce instant suffocation by exciting spasms in the glottis.

The effect of extraneous bodies fixing in the œsophagus, is, when of considerable bulk, gradually destroying respiration by pressing upon and obstructing the trachea; when sharp and angular their presence gives rise to inflammation, which terminates in suppuration or gangrene.

The practice to be adopted is cases of foreign bodies lodging in the pharynx or œsophagus, if engaged in the pharynx, which is easily ascertained by thrusting forwards and pressing down the tongue, is its being removed with the fingers or a pair of forceps; if it be lodged in the œsophagus, and beyond the reach of forceps, it should be extracted by means of a slender piece of whalebone, to the extremity of which a hook or several nooses of strong bristle are attached.

If the extraneous body cannot by any means be extracted, it should be pushed down into the stomach with a probang, and if suffocation be threatened, this proceeding ought to be executed with as little delay as possible.

It is a dangerous expedient to push hard, sharp pointed bodies into the stomach, and ought never to be resorted to, except in cases of the greatest emergency; for although innumerable instances are recorded of needles and similar bodies passing through the whole alimentary canal and being discharged per anum, or piercing the coats of the bowels, traversing along various parts of the body, and ultimately escaping at the surface, without producing any bad symptoms, yet they occasionally become fixed in the intestines, and induce inflammation, convulsions and death.

When the foreign body can neither be extracted nor

pushed down into the stomach, and it occasions no very urgent or dangerous symptoms, it may be allowed to remain until loosened by ulceration, when probably it may be ejected at the mouth; but if it fearfully interrupt respiration, it should be cut out, or recourse had to bronchotomy.

For pharyngotomy, the patient must be seated in a chair, with his head reclining backwards. An incision should then be made along the mesial or inner edge of the left mastoid muscle, commencing opposite the atlantal or superior border of the thyroid, and terminating on a line with the sacral or inferior border of the cricoid cartilage. As soon as the sheath of the carotid artery is fairly exposed, it should be drawn aside towards the shoulder; a long, curved sonde á dard should next be conveyed through the mouth, and the point of its stilet made to penetrate the left side of the pharynx, which appears at the very bottom of the wound. The surgeon then ascertaining that no artery lies in the way, fixes a bistory in the groove of the stilet, and running it onwards, lays open the bag of the pharynx. After the foreign body is extracted, the incision must be healed by the first intention.

The parts divided in this operation, are the common integuments; the platysma myoides; the constrictor pharyngis inferior; a small part of the constrictores medius and superior; the palato-pharyngeus and the stylo-pharyngeus, where the fibres of these intermix with each other at the lateral part of the pharynx; and the membrane of the pharynx.

FOREIGN BODIES IN THE TRACHEA.

The symptoms produced by the lodgement of foreign bodies in the trachea or larynx, are, convulsive cough, rattling and pain in the throat, difficulty of respiration, and hoarseness of voice, redness and swelling of the face, protrusion of the eyes, indescribable oppression, and sometimes emphysematous swelling of the neck.

The part at which foreign bodies generally lodge, is the opening of the glottis, in the ventricles of the larynx, or in the trachea; occasionally they descend into the bronchi. When fixed in the glottis, they occasion the most violent symptoms, and sometimes instant suffocation; when in the ventricles of the larynx, or in the trachea, the danger is not so immediate, the symptoms are generally intermitting, and death is produced in the course of a few days, by inflammation or effusion into the air cells of the lungs. When foreign bodies pass down into the bronchi, they excite suppuration of the lungs, the termination of which is usually fatal.

Sometimes these foreign bodies are expelled by the cough, and then either ejected from the mouth or unconsciously swallowed. For the most part, however, their removal can only be accomplished by making an opening into the larynx or trachea.

The former operation is termed laryngotomy, the latter tracheotomy.

The mode of performing laryngotomy is this: — The patient being laid on a table, with his head hanging over a pillow, the surgeon, by means of his left fore finger and thumb, fixes the larynx. He then makes a small incision exactly in the mesial line through the integuments situated over the crico-thyroid membrane, which he divides

by a transverse incision, after having fairly exposed it by drawing aside the sterno-hyoidei and sterno-thyroidei muscles. If the extraneous substance lie in the rima glottidis, it must bepushed upwards into the mouth by a probe. If it be lodged in the ventricles of the larynx, the whole anterior part of the thyroid cartilage should be slit open; if in the trachea, it will be necessary to divide the cricoid cartilage. In some instances the exotic body is expelled through the wound by the impetus of the expired air; in others it requires to be extracted with the forceps.

The important parts which are liable to be wounded in this operation, are the chordæ vocales, and a large branch of the superior thyroid artery.

The manner of performing tracheotomy is this: — The patient must be placed in the same position as in the operation of laryngotomy. The surgeon then fixing the trachea, begins his incision a little below the inferior lobes of the thyroid gland, and continues it downwards, along the mesial line to the extent of two inches. As soon as he has divided the integuments, he separates the opposite muscles from each other, and after having laid bare the trachea, he cuts through two of its rings in a longitudinal direction. The opening may be enlarged, if necessary, by cutting towards the cricoid cartilage.

If the surgeon does not proceed with caution he may wound the thyroid veins, which are situated in front of the trachea; or the carotid arteries, which lie on each side of it; or the thyroid gland, which is placed a little below the cricoid cartilage; or the subclavian vein, which runs just below the atlantal border of the upper bone of the sternum.

Laryngotomy is generally to be preferred to tracheo-

tomy. Tracheotomy however is the most eligible operation when the larynx is violently inflamed, or the impediment to respiration is situated below the crico-thyroid membrane.

There are other motives for this operation besides the extraction of foreign bodies from the wind-pipe, as for admission of air into the lungs, in cases of drowning, &c.; or where the respiration has become obstructed from angina or croup, from foreign bodies lodging in the pharynx or œsophagus, from wounds or tumours of the neck, or from swelling or enlargement of the tongue, tonsils or neighboring parts.

The contrivance for keeping open the artificial opening in the wind pipe, when made for the admission of air into the lungs is by cutting out a small portion of the cricoid cartilage or trachea, which is preferable to the introduction of a canula, the presence of which often occasions violent irritation and cough.

DISEASES, ETC. OF THE MAMMA.

These are inflammation, abscesses, scrofulous enlargements, sarcoma, scirrhus and cancer.

INFLAMMATION OF THE MAMMA.

The part becomes red, hot, swollen, tense and painful. The patient at the same time is affected with symptomatic fever more or less violent. When the inflammation extends to the mammary glands the swelling is hard and irregular, and the secretion of milk is generally sup-

pressed; but when it is confined to the integuments, the breast is uniformly enlarged, and the mammary secretion rarely becomes interrupted.

The causes of this disease are disorder of the uterine or gastric system, exposure to cold, sudden repression of the flow of milk, mental emotions, external injuries, &c.

It terminates either in resolution or suppuration. When an abscess does form, it usually bursts near the nipple.

In inflammation of the mamma endeavors should be made in the onset of the disease to bring about resolution by bleeding, warm saturnine lotions and fomentations, purgatives, and spare diet. If the patient give suck, the milk should be frequently drawn away. When suppuration cannot be prevented, recourse should be had to warm emollient poultices, and the abscess either opened by a lancet or allowed to burst spontaneously. In a chronic and deep seated mammary abscess sinuses are apt to form which require to be laid open and healed from the bottom.

SCROFULOUS ENLARGEMENTS OF THE MAMMA.

In this disease the breast is much increased in size, and when examined, presents a large, moveable tumour, situated immediately under the integuments, but not adherent to them; the skin is smooth and of its natural color, and the patient complains of little or no pain. When the tumour is irritated it grows painful and inflames; it then suppurates and discharges a thin serum mixed with curd-like matter.

In the first stage attempts should be made to discus the tumour by leeches, slight friction and the use of mild

aperients and tonics. When the swelling becomes irritable and painful, warm fomentations and poultices, purgatives and light diet constitute the curative process.

SARCOMA OF THE MAMMA.

In this complaint the breast gradually enlarges and often attains a prodigious size. The tumour has a fleshy feel, and is exceedingly firm, heavy and insensible. While it is small it occasions little trouble and the skin retains its natural color; but when it becomes large it creates great uneasiness; renders the subcutaneous venous branches varicose, and produces painful distension of the integuments.

Extirpation affords the only means of cure.

SCIRRHUS AND CANCER OF THE MAMMA.

This disease commences in the form of a small indolent movable tumour, which gradually increases in size, and after some time becomes knotty and irregular on its surface, and adherent to the skin. When the scirrhus terminates in cancer the tumour is affected with a prickling and burning sensation; at length it grows very painful, the integuments assume a puckered appearance, and the nipple is drawn inwards; the superficial veins daily enlarge, the skin turns livid, and at last ulcerates; the ulcer is deep and cauliflower like and, discharges a very offensive sanies; the axillary glands, after the lapse of a longer or shorter period becomes tainted; the thoracic viscera next participates in the disease, and the patient dies. This disease can only be removed by extirpation.

EXTIRPATION OF THE MAMMA.

For this operation the patient must be seated on a chair or laid on a table, with her arm raised to a right angle with the trunk of the body, and supported by an assistant. The surgeon then stretching the integuments, makes a simicircular incision at the under and outer part of the breast, extending in an oblique direction from the axilla downwards towards the sternum. This being done he now makes, at the upper and inner side of the mamma, another incision similar to and adjoining the extremities of the former one. As soon as the external incisions are completed the operator dissects the tumour from its surrounding connections, proceeding from the lateral or axillary, to the mesial or sternal angle of the wound, in the course of the fibres of the pectoralis major. The arteries should be tied as soon as divided, and wherever the pectoral muscle has grown to the diseased mass, the adherent part must be cut away. The axillary glands ought to be carefully examined, and if found to be enlarged and in a morbid state, removed. After the operation the lips of the wound should be placed in accurate contact and united by the first intention.

PARACENTESIS THORACIS.

The patient being seated with his head and shoulders reclining backwards, an insision two inches in length should be made upon the middle of the seventh or last true rib, half way between the spine and the sternum. The surgeon then dissects the integuments from the subjacent parts, and pulling them upwards towards the axilla exposes the upper or atlantal margin of the rib, close to which he divides the intercostal muscles to the extent of

half an inch. This being done he passes the point of his scalpel just through the pleura costalis into the chest. The flap is now to be brought down over the wound, when a curved director must be passed beneath it into the cavity of the thorax, and the matter evacuated.

When there is a large quantity of fluid contained within the thorax it is better to evacuated only a part of the fluid, then to close the wound, and take away the remainder after a lapse of a few hours, than to discharge the whole quantity at once.

After the fluid is discharged, if it be blood or water, the wound should be healed by the first intention ; if it be pus, the opening should be kept free by the introduction of a small tent which at proper intervals must be withdrawn in order that the matter may escape.

The surgeon is directed to divide the intercostal muscles close to the upper edge of the rib, in order that he may avoid wounding the intercostal artery, vein and nerve, which run in a groove at the inferior border of the ribs between the internal and external intercostal muscles.

DISEASES ETC. OF THE ABDOMEN.

PARACENTESIS ABDOMINIS.

The patient being seated on a high chair, a large napkin should be applied round the upper part of the abdomen, and committed to an assistant. The surgeon then takes a straight troçar and after smearing it with oil pushes it with a slight rotatory motion through the linea alba, two inches below the umbilicus, into the abdomen.

As soon as it has fairly entered, the stilet should be withdrawn, and the canula pushed further inwards. In proportion as the fluid escapes, the bandage must be tightened to compress the blood vessels and viscera, and prevent syncope. If a piece of lymph or omentum fall against the internal orifice of the tube and obstruct the current, it should be removed by the introduction of a blunt probe. After the operation, the canula must be taken away, the wound closed and a flannel roller passed round the abdomen.

HERNIA.

Hernia is a preternatural tumour occasioned by the protrusion of some of the viscera of the abdomen out of that cavity. In most cases, the displaced bowels are included in a bag derived from the peritoneum, which in their descent they push before them.

This peritoneal covering is termed the hernial sac, which surgeons have divided into mouth, cervix and fundus.

The cases which have no peritoneal covering, are hernia of the bladder, and hernia arising from penetrating wounds of the abdomen. Hernia of the cœcum receives only a partial covering from the peritoneum. Congenital hernia may be considered as having no peritoneal or hernial sac.

As the viscera generally descend from the abdominal cavity through the natural openings, the groin, scrotum, labia pudendi, bend of the thigh, and navel, are the most frequent seats of hernia. The situations next in frequency, are the vagina, perinæum, foramen ovale, and sciatic notch. Hernial tumours also occur in conse-

quence of external injuries, at various parts of the abdominal surface.

Herniæ are divided into several varieties, in consequence of their occupying different situations, as inguinal, scrotal, femoral, umbilical, vaginal, pudendal, perineal, ischiatic, thryroideal, ventral, and phrenic; and from their containing different kinds of viscera, into enteroceles, epiploceles, and entero-epiploceles. Herniæ are termed congenital, when they exist from the time of birth.

Enterocele implies that the hernial contents are intestine; epiplocele, that they are omentum; and entero-epiplocele, that they consist both of intestine and omentum.

The viscera that are most frequently herniated, are the omentum, the small and large intestines. The other abdominal viscera are sometimes found displaced; the stomach, urinary bladder, liver, spleen, uterus and ovaria, occasionally enter into the formation of hernial tumours. The pancreas and duodenum are never protruded.

The small intestines are most frequently herniated, in consequence of their occupying a more considerable portion of the abdominal cavity, and being less firmly fixed down by peritoneal ligaments than the latter. The ileum, from its great nearness to the inguinal ring, is more frequently protruded than the jejunum.

The portions of the large intestine which are usually protruded, are the cœcum and the sigmoid flexure of the colon.

The bowels, when they protrude, generally escape at the openings opposite to which they are naturally situated; but sometimes the sigmoid flexure of the colon protrudes through the right abdominal ring, and the cœcum

through the left; sometimes the ovary escapes at the umbilicus, and the liver has been known to form the contents of a femoral hernia.

The principal predisposing causes of hernia, are general relaxation, large size of the natural openings of the abdominal parietes, and weakness of the edges of these openings. Pregnancy, ascites, relaxation of the peritoneum, and elongation of the mesentery and omentum, have also been assigned as predisposing causes of hernia.

The principal exciting cause of hernia, is the pressure which the action of the diaphragm and abdominal muscles are constantly exerting upon the viscera contained in the belly. When there is a strong predisposition to hernia, as happens in children and aged people, the bowels are sometimes protruded by the slightest efforts, such as sneezing, coughing, crying, &c., or even by the act of ordinary respiration; but when the predisposition exists only in a very trifling degree, the protrusion does not take place except under great bodily exertion, when the diaphragm and abdominal muscles are thrown into a state of violent contraction.

When hernial tumours are produced by extreme bodily exertion, they appear very suddenly; but when they are the consequence of predisposition, or seem to take place spontaneously, their formation is very gradual. In the first instance, the opening through which the bowels escape is small, and there is great danger of strangulation; in the latter the opening is large and free, and strangulation less liable to be produced.

Hernia, for the most part, suddenly appears after some violent bodily exertion, and presents an indolent, soft, elastic swelling, which, in the recumbent position of the body, recedes spontaneously, or can easily be made to

disappear by the application of pressure, but returns as soon as the patient stands erect, and the pressure is removed. Its size is increased by holding the breath, or taking a large meal. A very perceptible impulse is communicated to it by coughing, and it is generally attended with vomiting, constipation, cholic pains, and other symptoms indicating a disordered state of the stomach and intestines.

The following are the marks by which to ascertain whether the rupture be an enterocele, an epiplocele, or an entero-epiplocele : — An enterocele, which is an hernia consisting entirely of intestine, for the most part takes place suddenly ; it is smooth, elastic, rendered tense by coughing, or by holding the breath, and when pressed upon, returns all at once, and generally with a gurgling noise. An epiplocele, or omental hernia, is usually tardy in its formation, and has a flabby or doughy feel ; its surface is uneven ; it is not made tense, nor receives any impulse from coughing ; it is more compressible, and when large much heavier than enterocele ; it recedes very gradually, and its reduction is unaccompanied with any gurgling noise. An entero-epiplocele, or a hernia composed both of intestine and omentum, is known by the first portion of its contents, when pushed back, ascending into the abdomen easily, and with a gurgling noise, while the latter portion is reduced with great difficulty and without any noise.

Hernia exists in three states, viz., the reducible ; the irreducible ; and the incarcerated, or strangulated state.

REDUCIBLE HERNIA.

A hernia is termed reducible when the protruded viscera continue to perform their functions, create no pain,

and can at any time easily be returned into the abdomen.

The treatment for a reducible hernia should be for the surgeon to replace the contents of the swelling within the abdomen, and secondly preserve them in that situation by means of a truss or bandage. The first object is to be accomplished in the following manner. The patient must be placed upon his back, with his chest and pelvis well raised by pillows, so as to curve the trunk of the body. If the case be an inguinal or femoral hernia, the thigh must likewise be put in a state of flexion, and the leg rotated inwards.

The surgeon then gently compresses the tumor in order to diminish its bulk, and pushing up the protruded parts in the same direction in which they descended, he readily conveys them back into the cavity of the abdomen. This operation is termed the taxis.

The direction in which a surgeon should push to reduce an inguinal, femoral or umbilical hernia, should, in inguinal hernia, be upwards and outwards towards the os ilium; in femoral hernia, if the tumour be small, he should push first dorsad or backwards, and then atlantad or upwards; in umbilical hernia, directly dorsad or backwards.

The tumour in femoral hernia, when it has attained a large size and become reflected over Poupart's ligament, should be pushed first downwards towards the knee and then backwards and upwards.

By elevating the chest and pelvis, the abdominal muscles, the Psoas magnus and the iliacus internus are relaxed; and by rotation of the leg inwards the tendon of the external oblique and the femoral fascia are also relaxed, in consequence of which the apertures that these

parts form, and that give passage to inguinal and crural hernia, are rendered less tense and resisting and reduction of course more easily effected.

It is only in recent cases of the disease that the hernial sac is capable of being returned into the abdomen along with protruded bowel. In those of long standing, it is so firmly united in consequence of inflammation to the other investments of the tumour that it cannot be reduced.

The truss is to be applied in this manner : the patient being placed on his back and the hernia reduced, the pad of the instrument which should neither be too hard nor convex, and thicker at its lower than its upper side, must be applied directly over the opening through which the bowel has descended. In external inguinal hernia it should cover both the superior and inferior abdominal apertures. The truss should be worn night and day, if possible ; if this cannot be done, it may be taken off at night, the patient being careful always to remove it after laying down and apply it before rising. If it be not properly adapted to the case, it produces pain along the spermatic cord, and inflammation of the testicle, and, by not affording sufficient support to the parts, sometimes allows a portion of the intestine to descend behind the pad, by the pressure of which it may become strangulated.

Trusses frequently effect a radical cure of hernia in children, though seldom in adults, never in the ruptures of old age. They produce this desirable result more frequently in recent accidental hernia, than in old spontaneous ones ; in inginal than in crural hernia.

IRREDUCIBLE HERNIA.

When the protruded bowels, in consequence of adhesions, or their enormous bulk, cannot be replaced into the abdomen, and yet at the same time are free from constriction, the case is denominated an irreducible hernia.

The contents of a hernial tumour are rendered irreducible, by their centracting adhesions with each other, with their containing sac, or with the peritoneum just within the abdomen; by the omentum or mesentery becoming enlarged, fleshy or loaded with fat; by the neck of the sac becoming thickened; by the protruded portion of intestine being filled with fœces or distended with air; and by the cavity of the abdomen suffering considerable diminution of capacity.

The most proper treatment to be adapted in irreducible hernia is to obviate costivness; to avoid violent exertions, and to support the tumour by a suspensory bandage.

Some cases of irreducible hernia are rendered capable of reduction by long confinement to bed, spare diet venesection, the use of purgative medicines and by pressure on the tumour. This plan of treatment, however, cannot succeed in those examples where the protruded viscera have formed adhesions with the peritoneal sac.

The reduction of old, large irreducible hernia is sometimes attended with unhappy effects, as vomiting, pain, and other alarming symptoms, inflammation, and death, by the introduction of parts a long time herniated into the abdomen, the capacity of which has become diminished and rendered incapable of again receiving them.

The practice has been tried of laying open the tumour of an irreducible hernia and then returning the displaced bowels into the abdomen, but this mode of practice has

been found dangerous, and even productive of fatal consequences.

STRANGULATED HERNIA.

Hernia is said to be strangulated when the protruded parts are not only incapable of being returned into the abdomen, but are affected with constriction, pain and inflammation, accompanied with obstruction of the intestinal canal. The tumour besides being irreducible is attended with considerable pain. The patient is affected with constipation, nausia, vomiting, fever, restlessness; the whole abdomen is painful, tense and swollen; the countenance expresses great anxiety, and the pulse is quick, hard and small. If the disease be not relieved a most distressing hiccough supervenes and the pain and fever becomes greatly aggravated and continues to increase in severity and violence for some time, at last suddenly cease. The patient now feels himself perfectly easy, the swelling and tension of the belly abates, the pulse is weak and interrupted, the tumour falls in, the integuments covering it turn soft and livid, and acquires an emphysematous feel; subsultus, tendinum and delirium then come on and death speedily ensues.

The small recent hernia suddenly appearing after some feat of strength, especially when they occur in young, vigorous men, are most liable to be strangulated. The hernia of adults are more readily strangulated than those of children. Spontaneous hernia seldom suffer strangulation.

Large, old hernia are less dangerous than small recent ones; epiplocele then enterocele; perinœal vaginal, or ventral hernia, than femoral inguinal or umbilical. A small strangulated portion of intestine is generally more perilous than a large one.

The cause of this is, that when the protruded portion of bowel is small, as happens in the first instance, the opening, through which it had escaped must also be small, and the constriction of course much greater than in cases of large hernia where the aperture or ring is very considerable and presses with but a moderate degree of force upon the displaced viscera.

The forcible pressure of the stricture on the protruded viscera is the immediate cause of strangulation. The stricture may be formed either by the neck of the sac; by preternatural adhesions in the body of the sac; by the tendinous opening through which the viscera have escaped; or by pieces of omentum becoming twisted round the intestine. In bubonocele the stricture is sometimes formed by the lower margins of the transversalis and internal oblique muscles.

When a hernia arises from accident and is strangulated soon after its formation, it is the tendinous opening through which the bowel protrudes that forms the stricture. The neck of the hernial sac forms the stricture in old hernia.

The manner in which strangulation is produced is this; as the opening through which the hernia descends, never spasmodically contracts, nor suffers any diminution from other causes, but always remains of the same diameter, and is entirely passive, it follows that the protruded viscera must strangulate, themselves and this they do in consequence of their bulk being increased. This augmentation of bulk of course is equivalent to a contraction of the diameter of the opening, and is produced in a variety of ways. For instance, when hernia, suddenly caused by some violent muscular effort becomes strangulated the strangulation generally arises from the displaced parts

thickening and swelling from inflammation. Secondly, strangulation of a chronic hernia is occasioned by the magnitude of the tumour being increased by the descent of another portion of the bowel, and if it be enterocele, by the intestine becoming distended with air, food or fœces.

Strangulation is divided into two kinds, acute and chronic. The former occurs in small, recent, sudden, accidental herniæ of young athletic adults. It is characterized by the inflamed, tense and exceedingly painful state of the tumour, as well as the extreme violence of the concomitant symptoms which not unfrequently terminate fatally in a few hours. The second takes place in the large, ancient herniæ of feeble aged individuals, and is commonly produced by an accumulation of the intestinal contents. In chronic strangulation the tumour is hard, heavy and attended with obtuse rather than acute pain while the other symptoms proceed with less violence and rapidity.

The constipation appears to arise more from inflammation of the bowels than from the pressure of the stricture mechanically obstructing their course, as it is present in an insuperable degree, whether only as a part, or the whole of the circle of the intestine be strangulated.

If inflammation of the bowels attack a patient laboring under a hernia, the indications by which we know whether it depends upon strangulation, or some internal cause are, when from the latter, the abdomen being painful tense and swollen while the tumour is soft and quite free from pain. The very opposite of this occurs, and the pain originates in and spreads from the tumour when the inflammatory affection arises from strangulation.

In cases of strangulated hernia the surgeon should first reduce the protruded and strangulated viscera by the taxis and then obviate or subdue inflammation by bleeding, purgatives, warm fomentations, low diet, and other antiphlogistic means.

A large strangulated hernia is most easy of reduction, as in the smaller the constriction owing to the narrowness of the opening is generally so violent as to render the replacement of the protruded bowels very dfficult.

If the reduction cannot be accomplished by the taxis alone, auxilary means should be had recourse to as venesection, purgatives, the warm bath, cold applications, and the tobacco clyster.

Venesection is most beneficial and proper in cases of the acute kind of hernia, when it is small and rescent, the abdomen painful, tense and swollen, and the patient young, vigorous and plethoric. The blood should be taken away very rapidly and in great quantities, so as to induce a state of syncope and general relaxation during which reduction by the taxis must be attempted. Bleeding may sometimes be employed with advantage in aged individuals and when the strangulation is of the chronic kind, though it should be in small quantities, just to obviate inflammation more than with a view of aiding manual reduction.

The warm bath is of the greatest utility when it is employed in the early stage of strangulation. Its operation is greatly assisted by the use of opiates. The bath proves beneficial by the general relaxation and fainting which it occasions, greatly conducing to the success of the taxis which should be tried while the patient is immersed.

Purgative medicines are most useful and proper in

omental hernia, and their administration should always be conjoined with bleeding and warm bath; they may be employed in very ancient and large intestinal herniæ; when the strangulation has been caused by an accumulation of fœcal matter. Even in examples of this kind however they may prove hurtful, if any inflammation be present.

Purgative medicines are always decidely injurious in recent intestinal strangulated hernia; especially when the strangulation is of the strictly acute kind.

The most eligible mode of applying cold in strangulated hernia is that of placing cold applications in the form of ice or solutions of nitrate and muriate of ammonia directly on the tumour itself. The cold bath is an uncertain remedy and therefore seldom prescribed.

The principle upon which tobacco clysters are recommended in strangulated hernia is from their producing in the whole system a state of extreme depression, during which the protruded parts either retire spontaneously or may easily be reduced by the taxis; these clysters are to be administered either in the form of smoke or infusion. The latter is generally preferred, and made by macerating for ten minutes a dram of the leaves of nicotiana tabacum in a pint of boiling water. No precise directions can be given with regard to the length of time that must be consumed in trying the preceding measures. The surgeon must be guided entirely by the degree of violence which the symptoms assume; and whenever the abdomen becomes distended and tender to the touch, and the tumour itself is hard and painful, he should not delay a moment performing the operation, which consists in laying open the hernial sac and dividing the stricture.

INGUINAL HERNIA, OR BUBONOCELE.

This disease is indicated by the appearance of a small indolent tumour at the groin, which is capable of being returned into the abdomen and possesses the other diagnostic characters of hernia already given.

Inguinal hernia most frequently presents itself on the right side.

The viscera which are generally protruded are the small intestines.

The diseases which may be mistaken for the bubonocele are, hydrocele of the tunica, vaginalis, testis, encysted, hydrocele of the spermatic cord, cirsocele, hœmatocele, detention of the testicle at the abdominal ring, bubo lumbar abscess, hernia humoralis and femoral hernia.

The marks by which the surgeon is to distinguish hydrocele of the tunica vaginalis from inguinal hernia are these, in hydrocele the swelling of the scrotum is uniform, transparent and fluctuating, begins below and gradually ascends towards the abdominal ring; the testicle cannot be felt; the spermatic cord is free and not in the least enlarged. The tumour is not affected by the patient's coughing, and its size is not increased in the erect nor diminished in the recumbent position of the body. — Whereas in hernia the swelling first presents itself at the inguinal ring and proceeds downwards; it is increased by coughing, its bulk is greatly affected by the various positions of the body, and it can be made entirely to disappear by pressure. The spermatic cord cannot be felt while the testicle easily can; and the stomach and bowels are generally disordered. In congenital inguinal hernia, although the testicle is not distinguishable to the

touch, the contents of the tumour can be pushed up into the abdomen.

Encysted hydrocele of the spermatic cord is to be distinguished by the gradual increase of the tumour; by its being incapable of reduction; its fluctuation; the equality of its surface, and by its size remaining unaltered in every position of the body.

To distinguish cirsocele from inguinal hernia, the patient should be placed in the horizontal position, and the tumour reduced by pressure; he should then raise himself erect and if the case be a hernea, the swelling cannot return so long as the pressure is continued; but if it be a cirsocele, it will not only reappear while the ring is compressed, but its size will be greatly increased, owing to the course of the returning venous blood being obstructed.

Hœmatocele is to be distinguished by the irreducible state of the tumour, by its not being affected by coughing, by its firmness, by its being unconnected with the spermatic cord, and by the discoloration of the integuments.

Detention of the testicle is to be distinguished by the sensibility of the tumour and the absence of the gland in the scrotum.

The diagnostic symptoms of bubo are the tumours being circumscribed, red, extremely hard and painful and not connected with the abdominal ring or spermatic cord.

Lumbar abscess is distinguished by the fluctuation of the tumour, by its having no connection with the spermatic cord, its being preceded by pain in the loins, and often accompanied with hectic fever.

Hernia humoralis is distinguished by the extremely

painful state of the testicle, hardness of the epididymus, pain in the loins, redness of the scrotum, and by the disease being generally preceeded by gonorrhea.

Femoral hernia is distinguished from inguinal by Poupart's ligament being felt passing over the neck of the sac, and the spine of the pubis situated on the same level, and rather within it.

In inguinal hernia, Poupart's ligament is below the neck of the sac, and the spine of the pubis behind and below it. Inguinal hernia is divided into two kinds, the external and internal.

EXTERNAL INGUINAL HERNIA.

The viscera in this hernia descend along the abdominal or inguinal canal, following the same course as the spermatic cord in the male, and the round ligament in the female.

The spermatic cord descends from the abdomen obliquely downwards and forwards along the inguinal canal into the scrotum; on first leaving the abdominal cavity it passes through an opening in the fascia transversalis, called the internal or upper abdominal ring; it then runs under the fleshy inferior borders of the transversalis and obliquus internus muscles and after continuing its course a little further down towards the pubes, finally emerges at the inguinal ring.

The spermatic cord consists of the vas deferens, spermatic artery, vein and nerve; all of which are closely united together by cellular membrane, and inclosed in a sheath termed the tunica vaginalis, a production of the peritoneum.

As it is necessary to well understand the surgical anat-

omy of the groin we will discribe the different fasciæ and muscles as they appear in the order of dissection.

As soon as the common integuments are divided and turned back, the fascia superficialis is brought into view. This fascia covers the sides of the abdomen, inverts the penis and sends a sheath to the spermatic cord; it then passes over Poupart's ligament, and extends over the fascia lata of the thigh. Beneath, or on the dorsal aspect of the fascia superficialis, lies the tendon of the external oblique, the fibres of which divide about an inch and a half from the symphysis pubis and form the inguinal or lower abdominal ring, which transmits the spermatic cord in the male and the round ligament of the uterus in the female. To the margin of this ring is attached a thin membrane termed fascia propria, which descends and covers the cremaster muscle. The tendon of the external oblique being separated from Poupart's ligament, and reflected upon itself, the obliquus internus and part of the cremaster muscle will be seen. Behind and connected with the internal oblique is the transversalis muscle. If the inferior borders of the transversalis and obliquus internus be drawn upwards the fascia transversalis will be exposed. This fascia is situated between the transversalis muscle and peritoneum, and forms the internal or upper abdominal aperture.

The inguinal ring is an opening formed by a division of the fibres of the external oblique muscle. It is not circular, as its name implies, but of a triangular figure, having its apex towards the ilium and its base towards the pubis. It has two sides or pillars which are distinguished by the terms upper or inner and lower or outer. The former or atlanto-mesial one is inserted into the symphysis pubis and into the os pubis of the opposite side;

the other or sacro-lateral one, is united with Poupart's ligament twisted inwards or dorsad and fixed to the tuberosity of the pubis and to part of the linea ilio-pectinea. These pillars are joined at their upper or iliac angle, by transverse tendinous fibres, which add considerable to their strength.

The upper abdominal ring is formed by the splitting of the fibres of the fascia transversalis. It is of the same size and form as the external one, and situated half way between the spine of the ilium and symphysis pubis. The inferior margin of the obliquus internus and transversalis muscle pass over its upper part; and Poupart's ligament runs along it lower or sacral side.

The abdominal canal is about three inches in length and extends between the internal and external abdominal apertures, running in the direction of Poupart's ligament. It is bounded sternad or anteriorly by the tendon of the external oblique, and dorsad or posteriorly by the fascia transversalis and part of the reflected tendons of the obliquus internus and transversalis muscles. It is filled by the spermatic cord, cellular substance and the cremaster muscles.

The effect which hernia has upon the abdominal ring is its gradually forcing it down from its natural situation nearer the pubis. In large inguinal hernia of long standing the upper or internal ring is brought so nearly opposite the external one, that the passage into the abdomen is almost direct.

The fascia tranversalis arises from the inner or dorsal side of Poupart's ligament and iliac portion of the linea-ileo-pectinea, and from part of the iliac fascia. It ascends for three or four inches between the transversalis muscle and peritoneum and is divided into the iliac and pubal portion. The use of the fascia transversalis is its

preventing the bowels from protruding under the inferior borders of the transversalis and obiquus internus muscles and also under Poupart's ligament, and it assists in the formation of the crural sheath. At the junction of the iliac and pubal portion, its fibres separate to form the upper abdominal ring which gives passage to the spermatic cord and round ligament.

The origin and course of the epigastric artery is this, it arises from the inner sides of the external iliac artery, and runs between the fascia transversalis and peritoneum obliquely upwards and inwards towards the linea alba, to get behind the rectus muscle.

In this course it crosses over the external iliac vein, passes behind the spermatic cord and then on the mesial border of the upper abdominal ring. It is situated two inches from the tuberosity of the pubis and has its accompanying vein on its mesial or inner side.

Its situation with regard to the hernial sac, is this : — It runs first behind and then on the mesial or inner side of the neck of the sac. By the long continued pressure of the protruded parts, it is often brought down from its natural situation, an inch or more nearer the pubis.

Occasionally the hernia descends on the dorsal or posterior aspect of the spermatic cord, but generally on the sternal or anterior part of the cord, immediately beneath the cremaster muscle. In some instances the distending force of the hernial tumour separates the spermatic vessels from each other.

The protruded parts in external inguinal hernia may be strangulated by the internal or external abdominal ring, or by the neck of the hernial sac ; sometimes both the abdominal rings strangulate the displaced bowel at the same time, though it is not a frequent occurrence ; the parts which form the stricture when the protrusion is at the inner

ring, are the inferior margins of the obliquus internus and transversalis muscles.

The parts which cover the hernial sac in external inguinal hernia, are the skin, fascia superficialis, fascia propria and cremaster muscle. The coverings in the female are thinner, as there is no cremaster muscle.

External inguinal hernia occurs more frequently in men than women; this arises from the abdominal canal and rings being more capacious and free in males than in females, and from the former sex being more engaged in laborious occupations than the latter. The period of life at which it most frequently takes place, is infancy and old age. The cause of its being more common in infancy than middle age, is from the abdominal rings being more lax and situated very near each other, and the abdominal canal being short and direct, consequently the viscera in this early period of life are more easily displaced at the inguinal ring than in adult life, when the parts become stronger, and the passage into the abdomen is more oblique.

The operation of dividing the stricture should be in the following way: — The patient must be laid supine on a bed, with his thigh bent on the pelvis; the operator then seating himself between the lower extremities of the patient, commences his incision an inch above the external angle of the inguinal ring, and continues it over the middle of the tumour to its most depending part. As soon as he has cut through the integuments, he slits open the fascia superficialis, fascia propria and cremaster muscle, layer after layer. Having exposed the hernial sac, he raises up its anterior and inferior part with a pair of dissecting forceps, and making an opening into it, and introducing a director, divides it upwards to within an

inch of the ring, and downwards to the termination of the first incision. He then feels for the stricture, and passing his finger or a grooved director under it, divides it by means of a curved bistory. The protruded parts are now to be freed from their adhesions, and if sound, returned into the abdomen. After the operation, the lips of the wound should be brought together by sutures and adhesive plaster.

The external pudic artery, which is the first branch sent from the femoral, is divided by the first incision, it being distributed on the integuments of the groin and external parts of generation.

The marks by which the hernial sac is distinguished from the intestine, is the surface of the intestine being smooth and covered with numerous blood vessels; the sac is rough on its surface, and generally contains a small quantity of fluid.

In external inguinal hernia, the stricture is to be divided directly upwards, or upwards and outwards, whether it be situated at the external or internal abdominal ring; it would be dangerous to divide it upwards and inwards, on account of the epigastric artery, which passes on the mesial or inner side of the neck of the sac.

If the protruded omentum has become enlarged, scirrhus, or mortified, it should be cut away and its bleeding vessels secured; as if it be reduced, it will excite inflammation.

If the intestine be mortified, though in a small degree, it may be reduced in the same manner as if it were in a sound and healthy state; but if the whole diameter of the bowel be mortified, the gangrenous part should be freely cut open, and the accumulated fœcal matter discharged. In both cases the poultices and fomentations should be

applied to the external wound, and clysters and purgative medicines administered. After some time, especially if the gangrene has been of small extent, the continuity of the intestinal canal is restored, and the artificial anus heals up.

In cases of mortified intestine, the surgeon should certainly divide the stricture, if there be no outlet for the fœces, otherwise its division is not necessary.

An artificial anus is most dangerous when situated near the stomach, because in this case the greater part of the chyle escapes through the opening, instead of being absorbed, and the patient dies of inanition.

The management of an artificial anus is this: — It should be covered by a compress of linen, retained by means of a moderately tight bandage. If the intestine becomes prolapsed, which it sometimes does from coughing or violent exertion, in consequence of the artificial opening not being surrounded with a sphincter muscle, it should be returned into the abdomen, lest it suffer from strangulation.

After the operation for strangulated hernia, the patient's bowels should be emptied by mild clysters and aperient medicine; he should be allowed only the sparest diet, and if inflammation come on, it should be subdued by the ordinary means.

The operation in cases of very large inguinal hernia, is as follows: — An incision is to be made two or three inches in length through the integuments over the external abdominal ring, laying open the other investments of the hernial sac, then passing a director under the tendon, and dividing it upwards by a probe-pointed bistory, leaving the peritoneal sac untouched. In some cases, however, the sac requires a small opening to be made into it

near the ring, before the division of the tendon can be accomplished.

External inguinal hernia is termed complete, when the protruded parts descend along the abdominal canal and come out at the inguinal ring; and incomplete, when they do not emerge at the external abdominal ring, but pass only through the internal one and remain lodged in the abdominal canal; the former, or complete kind, we have just been considering; of the latter, we shall now say a few words.

The parts which cover the incomplete inguinal hernia, are the common integuments, the fascia superficialis the tendon of the external oblique and the cremaster muscle. The investments of the hernial sac are thinner in the female than the male, because in the former the cremaster muscle is wanting.

The stricture in incomplete inguinal hernia is formed by the lower margins of the obliquus internus and transversalis muscles, which pass over the neck of the sac.

In incomplete inguinal hernia the spermatic cord lies behind the sac; the epigastric artery runs first behind and then on the mesial or inner side of the neck of the sac.

For the operation in incomplete inguinal hernia — an incision is to be made over the tumour parallel with the spermatic cord; dividing the fascia superficialis, tendon of the obliquus externus and the cremaster muscle successively; then laying open the hernial sac and last of all dividing the inferior border of the internal oblique and transversalis muscles, either directly upwards or outwards towards the illium.

INTERNAL INGUINAL HERNIA.

The appellation of ventro-inguinal hernia has been also given to this.

The opening through which the viscera protrude is the inguinal ring, but they do not pass along the abdominal canal; the direction in which they protrude is first under the lower margins of the transversalis and obliquus internus muscles, and then through the internal ring, passing in a straight direction from behind forwards.

The epigastric artery passes on the lateral or outer side of the mouth of the sac, and is three-fourth of an inch from it; the spermatic cord is situated on the lateral or illiac side of the neck of the sac.

We distinguish internal from external inguinal hernia, by the tumour in the former disease being smaller, more globular, and appears situated nearer the symphysis pubis, than in the latter kind.

The parts which cover the hernial sac are the skin, fascia superficialis, and fascia propria; it is not covered by the cremaster muscle.

The part which frequently forms the stricture in internal inguinal hernia, is the lower edges of the transversalis and obliquus internus muscles which pass over the neck of the sac immediately behind the external abdomenal ring.

The stricture should be divided directly upwards, or upwards and inwards; if it were divided upwards and outwards, the spermatic cord and epigastric artery might be wounded.

CRURAL HERNIA.

The viscera protrude through the crural ring beneath Pouparts ligament, at the inner part of the bend of the thigh in crural hernia.

The following is the order in which the different parts connected with this kind of hernia appear on dissection. Immediately under the integuments of the thigh is the fascia superficialis; beneath the fascia superficialis is a layer of cellular substance, absorbent glands, the great saphena vein and several cutaneous nerves. When all these parts are removed, the fascia lata comes into view which is divided into two portions, the illiac and the pubal. The illiac is affixed to two-thirds of the outer part of Poupart's ligament, and spread over the muscles on the fibular side of the thigh; its tibial or inner edge is of a crescent form and termed the falciform process. The pubal portion arises from the inner third of Pouparts, ligament and covers the pectinalis and triceps; it is thinner, and appears on a lower level than the iliac portion, and forms an oval depression at the upper and inner part of the thigh; it has laying upon it cellular membrane, a few lymphatic glands and part of the saphena magnum vein; it is bounded above by Pouparts ligament and at its upper and outer margin by the falciform process.

Poupart's ligament arises from the superior anterior spinous process of the illium, and is inserted into the spine of the os pubis.

Gimbernat's ligament is formed by that part of Pouparts ligament which is doubled in and fixed to the spine of the os pubis. It presents a sharp, firm, semilunar edge towards the abdomen and is broader in the male than the female.

The crural ring is bounded on the mesial or inner side by Gimbernat's ligament; on its lateral or outer part by the external iliac vein; on its sternal or fore part by Poupart's ligament, and on its dorsal or posterior part by the os pubis. The crural ring is closed up by cellular substance, lymphatic vessels, and sometimes an absorbent gland; it is relaxed by bending the thigh on the pelvis, rotating it inwards, and putting one leg across the other, and is made tense by extension, rotation outwards, and abduction of the thigh.

The cellular membrane which fills up the crural ring is termed the cribriform fascia, in consequence of its sieve-like appearance, which it derives from the numerous perforations made in it by the lymphatic vessels, as they ascend from the thigh into the abdomen.

The parts situated under the crural arch are, next to the pubis, the lymphatic vessels of the thigh, as they pass into the abdomen; exterior to these is situated the external iliac vein, close to the lateral or outer side of which is the external iliac artery; half an inch from the artery is the anterior crural nerve, and on the outside, and a little behind the nerve, are the psoas magnus and the iliacus internus muscles.

The relative situation of the hernial sac in crural hernia, with regard to the surrounding parts, is this: — The thin crescentic edge of Gimbernat's ligament is situated on the mesial or inner side of the neck of the sac; the os pubis behind it; the external iliac vein on its lateral or outer aspect; and its upper and outer part is bounded by the superior extremity of the falciform process.

The hernial sac is covered by the skin, fascia superficialis and cellular membrane; the hernial sac is not situated beneath the fascia lata, but generally rests on the

anterior surface of its pubal portion; when the viscera descend within the femoral sheath, the hernial sac is covered by the fascia lata.

The situation of crural hernia, with regard to the epigastric and obturator arteries, is this: — The epigastric artery passes on the iliac or outer side of the neck of the hernial sac, and is situated half an inch distant from it. The obturator artery, when it arises from the external iliac, or root of the epigastric, runs behind the neck of the sac; but when it is given off an inch from the origin of the epigastric, it passes over the fore and inner part of the hernial sac, and surrounds about three fourths of its circumference.

The spermatic cord crosses over the atlantal or upper part of the tumour, half an inch from the mouth of the hernial sac.

The tumour of crural hernia does not descend far along the thigh; as it increases in size, instead of passing down towards the knee, its fundus gradually rises up over the crural arch, and at length occupies nearly the same situation as inguinal hernia. The descent of crural hernia along the thigh is impeded by the very firm connexion of the fascia superficialis with the inguinal lymphatic glands.

The crural ring is the only part at which the viscera can descend under the crural arch — their descent at any other point is prevented by the very intimate adhesion of the fascia iliaca, fascia superficialis, and fascia lata, to Poupart's ligament.

The protruded bowels in crural hernia may be strangulated either by Gimbernat's ligament, the falciform process of the fascia lata, or by the neck of the hernial sac.

Crural hernia most frequently occurs in the female,

owing to the form of the pelvis, and narrowness of Gimbernat's ligament, rendering the crural ring wider in this than in the opposite sex.

The peculiar characters of crural hernia, are its seldom attaining a large size, and its descending through a narrow opening; it is very liable to become strangulated, it is extremely difficult of reduction, and always attended with great danger.

The diseases which may be mistaken for crural hernia, are inguinal hernia, swelled lymphatic gland, psoas abscess, varix of the femoral vein, and other tumours.

The following is the mode of dividing the stricture in crural hernia: — The patient being placed as in inguinal hernia, an incision, extending obliquely downwards and outwards, should be made over the centre of the hernial tumour; it should commence an inch above, and terminate a little below the base of the swelling. As soon as the integuments are cut through, the fascia superficialis, and adjacent condensed cellular membrane are next to be cautiously divided. This exposes the hernial sac, which must be laid open in the manner already directed. The surgeon should now feel for the stricture, and after passing a grooved director under it, he should divide it by means of a probe-pointed bistory. The direction in which the stricture should be divided is obliquely upwards and inwards towards the pubes; if the stricture were divided upwards and outwards, there would be a danger of wounding the epigastric artery. If the stricture were divided upwards, the surgeon might divide the spermatic cord. When the operator cuts inwards, he divides Gimbernat's ligament; and the division of this ligament relieves the strangulation when it is produced by the falciform process, because the one part is merely a continuation of the other.

CONGENITAL HERNIA.

The testicles of the male fœtus during the early period of gestation, are situated in the abdomen, a little below the kidneys; about the seventh month they descend along the inguinal canals into the scrotum, carrying before them a production of the peritoneum, which forms the tunica vaginalis. The communication between the tunica vaginalis testis and abdomen in general, soon becomes obliterated; sometimes, however, it continues open after birth, in which case the viscera escapes from the latter into the former cavity, and thus give rise to what is termed hernia congenita.

The protruded bowels in hernia congenita are not enveloped in the peritonæum, and may be said to have no hernial sac; they are lodged in the cavity of the tunica vaginalis testis, and lie in close contact with the tunica albuginea.

The surgical anatomy of congenital hernia is not different from that of external inguinal hernia.

Congenital hernia is to be distinguished from inguinal, or scrotal hernia, by its occurring in early life, and by its rendering the testicle incapable of being felt.

In the reducible state, the protruded viscera must be returned into the abdomen, and retained by means of a truss. The surgeon, however, should be careful not to apply this instrument before the testicle has descended into the scrotum. The treatment of strangulated congenital hernia is the same as that of strangulated bubonocele.

The stricture in congenital hernia most commonly exists in the neck of the hernial sac; sometimes, however, the protruded parts are strangulated by contractions in the body of the sac, or by the abdominal rings.

The direction in which the stricture should be divided is either directly upwards, or upwards and outwards towards the os ilium.

When the viscera contained in a common peritoneal sac descend into the cavity of the tunica vaginalis testis, the disease is named hernia infantilis.

The treatment of hernia infantilis must be the same as hernia congenita.

These are the parts which the surgeon has to divide in performing the operation for strangulated congenital hernia: the skin, the fascia superficialis, fascia propria, cermaster muscle and tunica vaginalis testis. In strangulated hernia infantilis, the operator must remember, after laying open the tunica vaginalis, to divide the peritoneal sac before reducing the displaced bowels.

UMBILICAL HERNIA.

When the disease occurs in infants, the bowels protrude directly through the opening which transmitted the umbibical vessels of the fœtus; but when it takes place in adults, they protrude by the side of this opening.

The viscus that is generally contained in umbilical hernia is the omentum; sometimes the tumour contains both omentum and intestine, and very rarely intestine alone.

The intestine most frequently protruded in umbilical hernia, is the transvers arch of the colon. Occasionally the small intestines and cœcum are herniated at the umbilicus.

The individuals most liable to this disease are children, pregnant females, and corpulent or ascitic people.

The protruded parts in umbilical hernia have a peritoneal sac and then covered by the common integuments.

In early life umbilical hernia may be cured by compression or ligature; both of which are more successful the sooner they are had recourse to. Compression generally proves effectual if employed when the patient is very young, as its operation is at this time assisted by the natural tendency of the umbilicus to contract. Umbilical hernia of adult age should be treated on the same principles as inguinal and crural hernia.

The stricture in umbilical hernia is formed of the tendinous opening in the linea alba, or the neck of the hernial sac.

In operating, the stricture should be divided directly upwards.

PERINŒAL HERNIA.

This is indicated by the appearance of a swelling on one side of the raphe of the perinæum which posseses all the diagnostic characters of a hernial tumour.

The herniated parts desend, in the male between the bladder and rectum; in the female between the vagina and rectum. The viscera that are protruded in perinæal hernia, are generally the small intestines, occasionally the bladder.

The parts, when reduced, should be supported by a compress and T bandage.

VAGINAL HERNIA.

In this disease a tumour is formed within the os externum, which has all the characters of other hernia. It generally contains the small intestines.

The protruded bowels should be reduced and retained by a pessary.

PUDENDAL HERNIA.

In pudendal hernia, the viscera descend between the vagina and ramus ischii, and form a tumour in the labium pudendi. This species of hernia is easily distinguished from bubonacele, but has sometimes been mistaken for ischiatic hernia.

It should be treated in the same manner as other hernias. Before the tumour is reduced the bladder should always be emptied. If the displaced bowels become strangulated, an operation should be performed and the stricture divided inwards, towards the vagina.

OBTURATOR HERNIA.

In obturator hernia the viscera protrudes through the opening at the upper and anterior part of the obturator ligament, which gives passage to the obturator artery, vein and nerve. The fundus of the hernial sac is covered by the pectinalis, and by the first and second heads of the triceps adductor femoris. The obturator vessels are situated behind, and the os pubis before the neck of the sac.

If an operation be required in obturator hernia, the stricture should be divided mesiad, or inwards.

VENTRAL HERNIA.

When the viscera become protruded through artificial openings in the abdominal parietes, the affection is denominated ventral hernia.

The causes of ventral hernia, are violent contusions, penetrating wounds, &c.

It most commonly occurs at the linea alba, between the recti muscles.

Ventral hernia is to be treated like other herniæ. It is seldom strangulated.

PHRENIC HERNIA.

This is formed by some of the abdominal viscera protruding through the diaphragm into the chest.

Mesocolic hernia is produced by the viscera insinuating themselves between the layers of the mesocolon.

Mesenteric hernia is occasioned by the viscera passing through a lacerated opening formed in one of the layers of the mesentery, in consequence of some violent concussions of the body.

No practice can be resorted to for the relief of phrenic, mesocolic, or mesenteric hernia, as their existence is not known during life.

CYSTOCELE, OR HERNIA OF THE URINARY BLADDER.

The urinary bladder is most frequently herniated at the inguinal ring. It is also protruded at the vagina and perinœum.

The symptoms of cystocele, are its producing retention of urine, accompanied with disorder of the intestinal canal. When the tumour is compressed, an inclination to expel the contents of the bladder comes on immediately. By retaining the urine the tumour is enlarged, but it diminishes and becomes flaccid on voiding it; the surgeon can do little else than support the tumour by means of a suspensory bandage. Strangulation seldom or never takes place. If calculi form in the bag of the herniated bladder, they should be cut out.

FISTULA IN ANO.

This is a term applied to every collection of matter formed in the vicinity of the anus.

The symptoms of true fistula in ano are, there being a discharge of thin sanies from the anus, or from a small fistulous opening in its immediate vicinity; the surrounding integuments being red and indurated, the patient complaining of pain in evacuating the fœces, and is not unfrequently affected with strangury and other disagreeable affections.

Fistula in ano is divided into three kinds, viz., the blind external, the blind internal, and the complete. The first obtains, when the abscess bursts externally; the second when it opens into the rectum; and the third, when it has not only an external aperture, but also communicates with the intestine.

If an abscess form near the anus, an early opening should be made into it, for the discharge of the matter. Gentle aperients must be administered, and if the inflammation be of the erysipelatous kind, great attention should be paid in correcting the morbid state of the constitution. When sinuses form, they must be laid open and healed from the bottom, the surgeon first ascertaining, by the introduction of a probe, their course and extent.

In the operation for blind external fistula, the patient being properly placed, a cylindrical piece of horn, smeared with oil, must be carefully placed in the rectum, to prevent the opposite side of the bowel from being cut. The surgeon then introduces a sharp-pointed bistory into the fistulous opening, and after conveying it to the very

bottom of the sinus, pushes its point through the coats of the rectum; he now draws the instrument towards himself, and divides the side of the intestine and sphincter ani; a dossil of lint should be inserted into the wound, an emollient poultice applied, the patient confined to bed, and gentle aperients administered.

The position of the patient, if the fistula be on the right side of the anus, should be that of leaning forward over a table; if it be situated on the left side, he should be placed in the same posture as in the operation of lithotomy.

It is always advisable to divide the sphincter ani, because the action of the muscle, if left uncut, by tearing asunder the sides of the fistula, greatly impedes the cicatrization of the parts.

In the operation for complete fistula in ano, the patient should be placed in the position already mentioned; the surgeon then introduces his left fore finger into the rectum; he then passes a probe-pointed bistory from the external, up to the internal fistulous orifice, and drawing the instrument towards himself, cuts through the side of the rectum, and divides the sphincter ani.

For the operation in blind internal fistula, the patient being properly placed, a small opening must be made with a lancet close to the anus; into this opening a sharp-pointed bistory should be introduced, and then pushed along the peripheral or outer surface of the rectum, up to the internal fistulous orifice, and the operation finished, as in complete fistula.

STRICTURE OF THE RECTUM.

Stricture of the rectum is divided into two kinds — spasmodic and permanent.

The symptoms of spasmodic stricture, are the patient's being affected with costiveness and pain about the anus, especially after having a motion; the fœces are flattened, small in diameter, and have a twisted appearance.

When the finger is introduced into the rectum, the lower sphincter is felt spasmodically contracted.

In the spasmodic stricture the intestine is sound. The cause of spasmodic stricture, is constipation, piles, drastic purges, &c.; the disease generally disappears under the use of gentle aperients conjoined with abstemious regimen.

The symptoms of permanent stricture of the rectum, are the fœces being flattened and diminished in volume, and the patient experiencing great difficulty in expelling them; the pain about the anus is very severe, and does not remit, as in spasmodic stricture.

When the finger is introduced into the rectum, the bowel is felt contracted two or three inches above its inferior extremity. If the disease be not checked, abscesses form in the vicinity of the anus, the internal membrane of the intestine ulcerates, and the patient dies.

Permanent stricture of the rectum requires the frequent introduction of bougies; the division of the callous, contracted part of the intestine; the removal of the numerous tubercles with which its inner surface is generally studded, or cutting through the fibres of the sphincter ani, forms the curative process. If the disease be connected with syphilis, mercury should be administered.

DISEASES OF THE PENIS.

The diseases of the penis are malformation, inflammation, lues venera, phymosis, paraphymosis, and cancer.

LUES VENERA.

The symptoms are divided into local and constitutional. The local have received the appellations of chancre and bubo.

Chancre generally appears about six days after the coition, and commences in the form of a small transparent pustule which in the course of a short time bursts and after discharging its contents degenerates into a deep spreading ulcer of a circular form, the edges of which are hard and thickened and surrounded by a pale colored inflammation. When chancre occurs on less tender and sensible surfaces, then the glans penis, as the scrotum perineum or outer aspect of the prepuce, the ulceration is not preceded by a vescicle but by redness and excoriation of the part.

Venerial bubo consists in an inflammatory affection of one of the inguinal lymphatic glands and arises from the irritation or absorption of venereal virus; commences with a feeling of uneasiness in the groin, especially during walking.

This is succeeded by preternatural redness of the integuments, and the formation of a small hard and painful tumour, which at first is about the size of a large bean, but speedily acquires that of a pullet's egg. If not discussed it proceeds rapidly to suppuration.

Sometimes however, the tumour does not burst but as

it continues to get larger, becomes extremely indurated and insensible.

The constitutional symptoms of lues venera first present themselves in the mucus membrane of the fauces mouth and nose; the eye is the part next affected then the skin and lastly the bones. When constitutional lues attacks the fauces and mouth, it produces in these parts deep white looking ulcers, having hard elevated and irregular edges and encircled by a dark colored erythematous inflammation. When it attacks the eye this organ becomes inflamed and ulcerated; and when the skin is contaminated, copper colored spots covered with thick scales appear on various parts of its surface, but especially on the breast, shoulders and abdomen.

These spots terminate in foul ulcers, from which an acrimonious and fœtid matter is discharged. When the disease settles in the bones, it renders them exceedingly painful particularly at nights; they inflame, become affected with exostosis, and eventually grow carious. The bones usually affected with lues, are those of the cranium, the inferior maxillary bone, the clavicle, sternum, distal extremity of the radius and the tibia.

When the chancre is recent and not inflamed, its surface must be washed with astringent lotions, or destroyed by lunar caustic; and a mild mercurial course conjoined with aperients, cleanliness rest and low diet resorted to. If the sore becomes indolent, a lotion containing oxymu. hydrag. or sulph. cupri. will accelerate its cicatrization. When chancre is inflamed all mercurial preparations and the application of caustic becomes inadmissible, while warm anodyne fomentations horizontal posture, purgative medicines and spare diet are the only means to be employed. Sometimes the ulcer grows irritable and instead

of contracting, spreads wider and wider, during the administration of mercury. Under these circumstances the mercury should be intermitted, and the case treated entirely on the antiphlogistic plan.

In the early stage of venereal bubo, when the tumour is small, it should be discussed by topical bleeding, the application of saturnine lotions to the groin, purgative medicines, confinement to bed and low diet. When the swelling is large and much inflamed, general blood letting will sometimes be advisable; and if it threaten to suppurate, recourse should be had to warm fomentations and poultices; if the abscess does not burst spontaneously, it should be opened either by a lancet or by means of caustic. In the treatment of bubo a mild mercurial course, consisting of frictions with ung. hydrag. and the exhibition of pil. hydrag. should be conjoined with the above antiphlogistic measures. When a bubo is in an indurated and indolent state, the frequent application of blisters to the groin, causes the tumour either to subside or suppurate.

In constitutional lues recourse should be had to friction with mercurial ointment, to mercurial fumigations and to the exhibition of the milder mercurial preparations so that the system may be speedily, though moderately affected by the action of that metal. The administration of sarsaparilla, guacum and nitric acid, along with the employment of mercury, will frequently expedite the cure. The nocturnal pains are best relieved by opium; the foul ulceration in the throat should be checked by the application of solution of oxymuriate of mercury, and the swellings of the bones, periosteum and tendons are most effectually dispersed by the repeated use of blisters.

PHIMOSIS.

When the prepuce is so contracted at its extremity that it cannot be drawn back so as to expose the glans penis, the disease is denominated phimosis; this is most commonly produced by inflammation of the prepuce. Sometimes it is a congenital affection.

When this complaint originates from inflammation, this must of course first be subdued, and then the surgeon should stretch the prepuce forwards, and by means of a phimosis knife introduced between it and the glans penis divide it by a longitudinal incision; this incision should be made either on the dextral, sinistral atlantal or sacral side, though the latter situation is to be preferred.

The congenital phimosis is best relieved by the operation of circumcision, which consists in taking hold of the extremity of the prepuce with a pair of forceps, and cutting as much of it away with a small bistory, as is deemed proper; the bleeding vessels are to be tied, and the two layers of the prepuce kept in accurate apposition by sutures applied near their edge.

PARAPHIMOSIS.

When the prepuce has been drawn behind the corona glandis, and will not again admit of being brought forward, the complaint is termed paraphimosis. In boys it is seldom attended with serious consequences, but when it occurs in adults, the skin of the prepuce often becomes violently inflamed and ulcerated, and the glans penis destroyed by mortification.

In recent cases the reduction is to be accom-

plished by first immersing the penis in cold water and then compressing the glans, and at the same time drawing the prepuce forwards. In the more advanced stage of the complaint, when the prepuce is considerably swollen the application of leeches and warm fomentations is necessary in order to relieve inflammation, before the parts can be handled. When all attempts at reduction prove ineffectual, the stricture should be divided by a scalpel and director.

CANCER OF THE PENIS.

This disease usually commences in the form of a small wart-like excrescence which appears on the prepuce or glans penis. It has a broad base, grows with great rapidity and is attended with considerable pain. After a longer or shorter period it ulcerates and discharges a thin offensive fluid. The edges of the ulcer are hard and irregular, and the parts immediately surrounding it of a deep purple hue. If the disease be not extirpated, the ulceration spreads wider and wider; the inguinal glands become contaminated, they swell and grow painful; fistulous openings form along the course of the urethra and the patient at last sinks under the excessive irritation.

This disease can only be removed by amputation.

AMPUTATION OF THE PENIS.

The patient being seated on the edge of a chair the operator lays hold of the penis with his left hand, and drawing it towards himself, so as to stretch the skin, divides it with one stroke of the scalpel; he then ties the arteries, brings the prepuce over the end of the stump and introduces a flexible gum catheter along the urethra into the bladder.

If there be much hœmorrhage from the wound, lint must be applied to it and a moderately tight bandage put round the penis.

When the penis is to be amputated very near the pubes it must not be cut through at one stroke, but by several successive incisions, the surgeon taking care to secure each artery as soon as divided. Before the operation is begun, the skin should be well drawn forward and fixed with a tape.

DISEASES OF THE URETHRA.

These are inflammation, gonorrhœa, stricture, abscess, fistula, false passage, calculi lodging in it.

GONORRHŒA.

There are three kinds of gonorrhœa, viz. gonorrhœa simplex, gonorrhœa virulenta and gonorrhœa chronica.

Gonorrhœa simplex is nothing more than a slight inflammatory affection of the urethra, the secretion of the mucus glands of the canal is preternaturally increased; the discharge for the most part is thick, white and without acrimony; it is not contagious, but sometimes becomes thin, yellowish colored, and attended with considerable uneasiness or even pain in voiding urine.

This disease is produced by the application of irritating substances to the urethra, such as acrimonious injections, bougies, &c. Sometimes it arises from excess in venera, cold, the improper use of cantharides, frequent purging, violent horse exercise, or the irritation of teeth-

ing. Gonorrhœa simplex generally soon disappears under the use of warm fomentations, poultices and demulcient injections conjoined with mild cathartics, diluents, low diet and rest.

In gonorrhœa virulenta the patient first complains of a slight itching on the glans penis, accompanied with a tingling sensation and tenderness along the course of the urethra. In a short time some uneasiness is experienced on making water, and a whitish purulent matter appears at the urethral orifice, the edges of which look red and thickened; in two or three days the quantity of the discharge is increased, and, as the inflammation advances, becomes thinner, more acrimonious, and of a yellow or greenish color; a severe scalding pain is now felt on passing the urine, which is sometimes mixed with blood, and generally flows in a small broken stream, owing to the calibre of the canal being contracted. The glans is extremely red and the whole penis tense, swollen and knotty; involuntary erections attended with excruciating pain and chordee take place, particularly at nights, and the patient is affected with headache, restlessness and other symptoms of fever. If the disease be not checked the inflammation spreads to the prepuce lymphatic glands of the groin, testis, prostrate gland, or the neck of the bladder, giving rise to phimosis, bubo, hernia humoralis, tenesmus, constant micturition, or total suppression of urine.

Gonorrhœa virulenta is produced by the immediate contact of a specific virous contained in the discharge from the urethra or vagina of an infected person.

The discharge is secreted from the internal membrane of the urethra and its lacunœ, both of which are in a state of inflammation.

The treatment in gonorrhœa virulent should be to subdue the inflammatory action of the first stage; recourse should be had to saline purgatives, bleeding, and other antiphlogistic measures and to relieve the ardor urinæ, chordee and nocturnal erections, the surgeon should prescribe warm fomentations and anodyne injections, in conjunction with opium, camphor and hyosciamus.

In the second, or chronic stage, the cold hip bath, tonic medicines, cubebs, balsam of capaiba, tincture of cantharides, &c. are the most effectual remedies.

STRICTURE OF THE URETHRA.

The first symptom is a frequent inclination to make water, accompanied with a gleety discharge from the urethra. As the obstruction increases, nocturnal emissions of semen take place, the urine is not passed without pain and effort, and the stream is scattered and diminished in size. In the advanced stage of the disease, the urine comes away by drops, and is sometimes mixed with purulent matter or glary mucus; the patient is distressed with severe pain in the loins, and often attacked with violent paroxysms of fever. Exposure to cold, exercise, excess in venery, and the pleasures of the table, aggravate all the symptoms of stricture, and cause complete obstruction of urine.

Strictures are divided into permanent, spasmodic, and mixed.

Stricture of the urethra most frequently occurs just behind the bulb; it also often takes place close to the external orifice of the urethra, or four inches and a half within the canal.

The evils resulting from stricture of the urethra, are inflammation and thickening of the bladder, retention of urine, dilatation and ulceration of the urethra. When the urethra ulcerates, the urine escapes into the cellular membrane, and produces inflammation, gangrene, urinary abscess, and fistula.

The situation and extent of the stricture must be ascertained; if the contracted part be found to be extensive, it should be removed by dilatation; for this purpose, metallic or common bougies should be employed; they should always be introduced in the morning, and allowed to remain in the passage as long as the patient can bear, and their size should be gradually increased.

If the stricture be very narrow, or form merely a ring in the urethra, or if it be of the irritable or spasmodic kind, it should be destroyed by the caustic bougies, which ought to be applied every morning or evening, or every second morning.

When the stricture occupies a large portion of the urethra, and is so complete as entirely to prevent the introduction of the bougie, in this case the symptoms should be relieved either by opening the urethra behind the stricture, or by puncturing the bladder through the rectum. The stricture should next be destroyed, and as soon as this is accomplished, the artificial passage heals up, and the urine again flows along its natural channel

URINARY ABSCESS AND FISTULA.

When stricture has advanced so far as to render the urethra completely impervious, the passage becomes ulcerated immediately behind the seat of obstruction, and the urine is forced into the cellular membrane; the

injected parts swell and inflame, suppuration speedily takes place, and a fistulous opening is produced.

In the treatment of urinary abscess, as soon as the extravasation of urine has occurred, the surgeon should introduce a catheter into the bladder, and this he easily accomplishes, if the ulceration has destroyed the stricture, which not unfrequently happens; he should then make an incision into the swelling, reduce the inflammation by bleeding and warm fomentations, and not withdraw the catheter until the parts are healed. If the introduction of the catheter be impracticable, the surgeon should in this case, after opening the swelling and subduing the inflammation, destroy the stricture by the caustic or common bougie. When the stricture is removed, the fistula generally closes. Where the bougie proves ineffectual, a staff must be passed down the urethra as far as the stricture, the passage laid open, a catheter conveyed into the bladder, and retained until cicatrization be complete.

DISEASES OF THE SCROTUM.

These are anasarcous swelling or hydrocele, ædematodes, varicocele, hœmatocele, sarcomatous enlargement, and cancer.

ANASARCA OF THE SCROTUM.

Anasarca of the scrotum presents a soft, inelastic tumour, which, when pressed upon by the finger, retains the mark for some time; the skin is not inflamed. When

the disease is slight, the scrotum preserves its natural rugosity; when severe, it becomes smooth and tense. Sometimes the serous fluid passes from the cellular membrane of the scrotum into that of the prepuce, in which case the penis appears twisted and deformed.

When this disease is a symptom of anasarca or ascites, it can only be removed when the original complaint is cured; but when it is purely local, it generally soon disappears under the use of cold lotions and purgative medicines. If the skin of the scrotum be much distended, the accumulated serum should be discharged by several punctures made with the point of a lancet. Large incisions ought to be avoided, as they are dangerous, and not unfrequently produce mortification.

VARICOCELE.

This is a morbid and permanent enlargement of the veins of the scrotum. It is produced by violent exercise, or the long continued pressure of a truss. The treatment consists in suspending the scrotum by means of a proper bandage.

HŒMATOCELE.

This is a swelling of the scrotum or spermatic cord, produced by an accumulation of extravasated blood.

There are five kinds of hœmatocele; one is situated in the cellular membrane of the scrotum, one in the membrane surrounding the spermatic vessels, one within the tunica abuginea, and two in the tunica vaginalis testis.

The first kind of hœmatocele is produced by blows or other injuries inflicted on the scrotum, whereby the ves-

sels are ruptured, and the blood effused into the cellular membrane; the second arises from rupture of one of the spermatic veins; the third is connected with disease of the testicle; the two last are occasioned by a vessel of the vaginal coat either being wounded during the operation for hydrocele, or spontaneously bursting after the operation has been performed. In both cases the blood is contained in the tunica vaginalis.

Hœmatocele of the cellular substance is for the most part readily dispersed by cold lotions, camphorated embrocations, leeches, suspensory bandage, and saline purgatives; if discutient means prove ineffectual, a free incision should be made into the swelling. Hœmatocele of the spermatic cord is generally reduced by cold applications, stimulating liniments, gentle compression, bleeding, purgatives and confinement to bed; if these means fail to produce absorption of the effused blood, the tumour should be cut open, and the bleeding part plugged with a dossil of lint, or the vessel tied. Hœmatocele of the tunica albuginea requires extirpation of the testicle. Hœmatocele of the tunica vaginalis, when existing only in a slight degree may be removed by discutient lotions and saline cathartics. When the complaint is very considerable, an opening should be made into the tunica vaginalis, the extravasated blood discharged and dry lint applied to the central or inner surface of the membrane.

SARCOMA OF THE SCROTUM.

When the scrotum is affected with sarcoma, it grows to a most enormous bulk. The tumour is never painful and only creates inconvenience by its size and weight. Its surface is generally smooth though sometimes covered

with yellowish scales and small herpetic ulcers. The testicles and spermatic cord are generally in a perfectly healthy condition.

The diseased mass should be cut away, care being taken during the operation not to wound the testicle, spermatic cord, corpora cavernosa, penis or urethra.

When the tumour is removed, the skin should be applied over the testicle, and the lips of the wound secured by plaster and bandage.

CANCER OF THE SCROTUM.

The lower surface of the scrotum is the part where this disease makes its first appearance. It produces a painful ulcer with hard elevated edges, and after making its way through the scrotum affects the body of the testicle; it then spreads along the spermatic cord, and contaminates the inguinal glands; at last it is communicated to the abdominal viscera, and ultimately destroys life. The disease is occasioned by soot lodging in the rugœ of the scrotum and by its acrimony irritating the part.

This disease is to be cured by the immediate extirpation of the ulcerated part. If the operation be delayed until the system or even the testicle become tainted, it is quite unavailing, the disease speedily returns and the patient perishes.

DISEASES OF THE SPERMATIC CORD.

The spermatic cord is affected with diffused or encysted hydrocele and cirsocele.

DIFFUSED HYDROCELE OF THE SPERMATIC CORD,

Is a collection of watery fluid in the cellular membrane surrounding the spermatic vessels. The swelling is of a pyramidal figure and unattended with pain. By the application of pressure it appears to diminish, but speedily acquires, either in the supine or erect posture, its usual size, as soon as the pressure is removed. The testicle is felt below the swelling, and the scrotum hangs lower on the diseased than on the opposite side. The patient complains of uneasiness in the loins, and when the tumour becomes very large, it occasions great inconvenience. This disease is liable to be mistaken for cirsocele or omental hernia.

When the tumour is small, the patient should have recourse to a suspensory bandage; but when it has attained a large size, it must be laid open by an incision, extending from the abdominal ring to the testis.

ENCYSTED HYDROCELE OF THE SPERMATIC CORD.

In this complaint the fluid is contained in one particular cyst. The tumour is of an oblong form, and situated between the testis and abdominal ring. It never occasions any pain, is generally very tense, and possesses considerable transparency. It receives no impulse from coughing, and its size is not altered by change of position. This disease most frequently occurs at the early period of life.

The diseases which may be mistaken for it are hydrocele of the tunica vaginalis testis, and hernia. In hydrocele of the tunica vaginalis, the swelling is first perceived at the lowest part of the scrotum, and when

small, has the testicle laying above it; after it has attained a large size, the gland is felt hard at its middle and posterior part. In encysted hydrocele of the spermatic cord, the swelling is always above the testicle, feels like a distended bladder, and has no hardness in any part of it.

This disease may be distinguished from hernia, by its very gradual appearance and increase; by its size and form remaining unaltered in every position of the body; its incapability of being returned into the abdomen; its receiving no impulse from coughing, nor becoming enlarged by holding the breath; and by its being attended with no derangement of the intestinal canal.

In children the disease usually disappears under the use of aperient medicines and warm fomentations. If it resist these means, the swelling must be punctured, and its contents discharged.

If the tumour be large and of long standing, the cyst should be exposed by carefully dividing the integuments; its anterior part should then be cut away, the lips of the wound closed by a suture, and the inflammation subdued by emollient poultices.

CIRSOCELE.

This is a varicose enlargement of the spermatic veins. It generally commences close to the testicle, and for the most part appears very gradually. The swelling, which extends upwards as far as the abdominal ring, is knotty and unequal, tender to the touch, and creates a sensation of weight in the scrotum, and usually a feeling of numbness in the thigh; it is increased by exercise, long standing, or violent exertion.

In the advanced stage, cirsocele is attended with severe pain, that stretches to the back and loins; and when large, it presses upon, and wastes away the testicle.

Cirsocele most frequently occurs on the left side; which circumstance may be attributed to the circulation of the left spermatic vein being interrupted by the pulsations of the aorta, which passes behind the left renal vein, in which the spermatic terminates; and also by the pressure of hardened fæces accumulating in the sigmoid flexure of the colon.

The causes of cirsocele are tumours pressing upon the vena cava inferior; the pad of a hernial truss violently compressing the spermatic cord; blows upon the groin; excess in venery, &c.

In recent cases, the patient should be recommended to wear a suspensory bandage, and frequently to wash the tumor with cold astringent lotions. If the disease create much pain, he should be confined to the horizontal posture, apply leeches to the groin, and take aperient medicine. If the symptoms do not yield to this treatment, recourse should be had to castration or removal of the diseased veins.

The mode of performing the operation of removing the varicose spermatic veins is this. The patient being seated on a chair, the surgeon takes hold of the tumour with his left hand, and after dividing the integuments by an incision, extending from the abdominal ring to the bottom of the scrotum, he opens the tunica vaginalis and exposes the spermatic veins. He then separates the diseased vessels from the other parts of the cord, passes two ligatures round them, one above and the other below, and cuts them completely away with a pair of scissors.

As soon as the enlarged veins are removed, the testicle which dropt from the scrotum should be replaced, the lips of the wound united by the interrupted suture, the patient placed in bed and the inflammation subdued by antiphlogistic measures.

DISEASES OF THE TESTICLE.

The principle diseases are inflammation, abscess, superficial or benign fungus, scrofulous enlargement, sarcocele, scirrhus, cancer, and fungus hœmatodes.

Inflammation of the testicle is generally termed hernia humeralis; in the beginning of this disease the testicle is swollen, soft and tender to the touch; after a short time it becomes hard and extremely painful. The spermatic cord is also very tender and its veins are occasionally varicose. The patient is affected with depression of spirit, pain in the loins, sickness, violent fever, and sometimes difficulty of making water.

The causes of hernia humeralis are external injuries, and irritation of the urethra.

The treatment consists in the repeated abstraction of blood from the inflamed part by means of leeches; in the exhibition of emetics and purgatives; the use of warm fomentations and emollient poultices; confinement to the horizontal posture, and spare diet. If the fever run high, the pain in the loins be severe, and the patient young and vigorous, blood may be taken from the arm. If the disease terminate in suppuration, an early opening should be made for the discharge of the purulent matter. The hardness which generally remains in the

epididymis after the inflammation is removed, may be dispersed by friction with camphorated embrocations.

LIPOMA OR BENIGN FUNGUS OF THE TESTICLE.

Lipoma of the testicle presents an indolent excrescence of a red color, arising through an ulcerated opening in the scrotum, from the glandular substance of the testicle, or from the surface of the tunica albuginea. This disease is generally produced by some external injury of the testicle. It should be removed by excision, ligature or caustic.

SCROFULOUS ENLARGEMENT OF THE TESTICLE.

When the testicle is affected with scrofulous enlargement as it increases it softens, but seldom or never occasions any pain. If it suppurate, which is not unfrequently the case, it discharges a thin serum mixed with curd-like matter.

The individuals most subject to this disease are children, and those of scrofulous constitutions.

In the first stage, endeavors should be made to effect the resolution of the swelling by gentle friction, seaweed poultices, the use of a suspensory bandage, and by the exhibition of mild aperients in conjunction with tonic and alterative medicine. If the gland become painful and threaten to suppurate, recourse should be had to warm fomentations and poultices, and an early opening made into the abscess.

SARCOCELE.

In this disease the testicle becomes enlarged, indurated and extremely heavy. It creates little or no pain; but

produces considerable uneasiness by dragging down the spermatic cord. The tumour at first is smooth, oval and flattened at its sides, but as it increases in bulk, irregularities arise on its surface, and it loses the natural form of the testicle. When it acquires a malignant character, it ulcerates, fungi spring up from the ulcerated part, the abdominal viscera and general system become affected, severe constitutional irritation comes on, and the life of the patient is sooner or later destroyed.

Some kinds of sarcocele are to be cured by emetics, mercurial friction, cold lotions, leeches, suspensory bandage, &c. In general, however, the disease can only be removed by castration.

SCIRRHUS AND CANCER OF THE TESTICLE.

When the testicle becomes scirrhus, its substance acquires great hardness, its surface is knotty and irregular, its size is generally increased, and its function destroyed. Scirrhus of the testicle is usually the result of inflammation or external injury, and is never accompanied with much pain.

When pain attacks the testicle, already affected with the symptoms of scirrhus, it is then regarded as cancerous. The pain shoots violently from the testis along the spermatic cord, which appears enlarged and knotty; the skin of the scrotum is of a livid color and its veins are varicose. When the tumour ulcerates, it discharges an offensive sanies; the inguinal glands and abdominal viscera at last become tainted, and the patient soon dies.

Neither scirrhus nor cancer can be removed except by extirpation of the testicle.

FUNGUS HŒMATODES OF THE TESTICLE.

Fungus hœmatodes of the testicle produces an enlargement of the testicle. The tumour has a smooth, soft, elastic, and somewhat fluctuating feel; it is attended with no pain, but occasions by its weight considerable uneasiness in the loins. If the disease be not extirpated in its early stage, it soon involves the spermatic cord, inguinal glands and other parts, which seldom fail to destroy the life of the patient.

CASTRATION.

For this operation the patient must be seated in a chair, with his head and shoulders reclining backwards. The surgeon then grasping the tumour in his left hand, divides the integuments by an incision extending from the abdominal ring to the bottom of the scrotum. As soon as he has exposed the spermatic cord, he detaches it from its surrounding connexions; and then separates the blood-vessels from the vas deferens and includes them in a ligature, a little below which, he cuts through the whole cord.

This part of the operation being finished, the testis should then be dissected out from the scrotum, and the artery of the vas deferens and the spermatic artery tied. The first ligature is now to be removed, and the lips of the wound brought together by sutures and adhesive plaster.

The artery of the scrotum sometimes requires tying. If the skin of the scrotum be in a morbid condition, the diseased portion should be included in two elliptical incisions, and removed along with the testicle.

HYDROCELE.

This is a preternatural accumulation of serous fluid in the cavity of the tunica vaginalis testis. The characters of this disease are, its presenting a pyriform, elastic swelling of the scrotum, which first appears at the inferior extremity of the testicle, and gradually ascends towards the abdominal ring. The disease is attended with no pain, and generally takes place very slowly; sometimes, however its accession is sudden. It seldom occurs on both sides at once, but more frequently on the left than the right. It is more common in warm than in cold climates, and in some countries seems to be endemic. The tumour is generally hard at its posterior part, where the testicle is situated, and in its early stage is transparent and fluctuating.

For the most part, the testicle lies on the dorsal or posterior aspect of the tumour; occasionally, however, it is situated on its sternal or anterior aspect. In hydroceles of long standing, the spermatic vessels are sometimes separated from each other, and spread over the forepart of the lower extremity of the tumour. The fluid does not entirely surround the testicle, for it cannot at its posterior part, where the tunica vaginalis is intimately incorporated or continuous with the tunica albuginea.

Hydrocele most commonly makes its appearance without any assignable cause; occasionally it is produced by inflammation or contusions of the testicle. Sometimes it is a congenital affection.

The diseases for which it may be mistaken are, hernia, sarcocele, fungus hœmatodes, and anasarcous swelling of the scrotum.

The indications by which hydrocele is to be distinguished from sarcocele is from the tumour of the latter being heavy and extremely firm; generally irregular on its surface, and attended with pain: in hydrocele, it is soft fluctuating, smooth on its surface, and accompanied with no pain.

To distinguish hydrocele from fungus hœmatodes is sometimes difficult; fungus hœmatodes, however, may commonly be known by attending to the history of the case; by the weight of the swelling; by its not being transparent, its commencing in the body of the testicle; by its being generally attended with an enlargement of the spermatic chord, and in its latter stage with disorder of the constitution.

The diagnostic characters of anarsarcous swelling of the scrotum, are the tumours retaining the impression of the finger; its having a soft doughy feel and being often connected with ascites or anasarca.

What is meant by hydrosarcocele is when hydrocele is complicated, with a morbid state of the glandular substance of the testicle.

The treatment of hydrocele is divided into two kinds, the palliative and the radical. The palliative consists in merely evacuating the collected fluid by means of a trocar; the operation being repeated as often as the cavity of the tunica vaginalis becomes filled, and the scrotum distended to an inconvenient bulk.

The radical treatment consists in not only discharging the serous fluid, but in preventing its return, by exciting such a degree of inflammation on the surface of the tunica albuginea and tunica vaginalis, as will either produce a permanent adhesion between these two membranes, by which the cavity of the latter may become obliter-

ated, or as will entirely remove the morbid action of their secreting or absorbing vessels.

The mode in which the radical cure is to be effected, is by laying open the tunica vaginalis throughout its whole extent, which is termed incision; by introducing a tent or seaton into it; by removing a small portion of its anterior part, which is denominated excision, or by injecting some stimulating fluid into its cavity, or lastly by applying cold lotions to the scrotum; but the three last methods are the most eligible. Cold applications are most successful in those cases of hydrocele, that occur in young subjects.

For the operation of excision, the patient must be seated in a high chair with his head and shoulders reclining backwards. The surgeon then makes a small incision into the tunica vaginalis, and after discharging the fluid, he draws out a portion of the membrane by means of a hook and cuts it off with a pair of scissors. The effects of this operation is that it generally produces sufficient inflammation to destroy the unhealthy action of the secreting or absorbing vessels of the tunica albuginea and tunica vaginalis, but seldom such a degree of it as to cause these membranes to become united to each other by adhesion.

The operation of injection after the evacuation of the serous fluid, is by far the most preferable way of exciting inflammatory action of the sac.

The patient should be seated as for the operation of excision, the surgeon should grasp the scrotum in his left hand; then taking a trocar in his right hand he carefully introduces it at the anterior and inferior part of the swelling. As soon as the instrument has entered the cavity of the tunica vaginalis, he withdraws the stilet,

and at the same time pushes the canula further in. When the serous fluid is discharged, a weak solution of sulphate of zinc or port wine should be injected through the canula until the scrotum is distended nearly to its former size. The injection must be allowed to remain in the sac for four or five minutes and then evacuated. This being done, the wound should be closed and the patient put in bed. The trocar should be pushed obliquely upwards, if pushed in a horizontal direction it would wound the testicle.

The dangers occasionally resulting from this operation, are that the testicle is sometimes attacked with such violent inflammation, that it suppurates, and its structure becomes nearly or altogether destroyed; and sometimes the injection, owing to the canula slipping out instead of passing into the cavity of the tunica vaginalis, is forced into the cellular membrane of the scrotum, in consequence of which the parts inflame and suppurate, and in some cases mortify and slough away, leaving the testicles quite bare.

The peculiarities connected with congenital hydrocele are that, communication between the abdomen and tunica vaginalis testis remains open, and the disease is sometimes complicated with congenital hernia.

The fluid of congenital hydrocele should be pressed up into the abdomen and a truss applied over the inguinal ring to prevent its return. In a short time it becomes absorbed, the communication between the cavity of the abdomen and that of the tunica vaginalis permanently closes, and the patient is entirely relieved from his complaint.

If this treatment fail to remove the disease, the radical method of cure should be had recourse to; care being

taken during the operation to apply strong pressure over the inguinal ring, so that the injection may be prevented passing into the abdominal cavity, where probably its presence might excite dangerous inflammation.

RETENTION OF URINE.

When the flow of urine is completely obstructed, the fluid accumulates in the bladder and distends it to such a degree, that it rises up above the pubis, and forms a tumour, which can be felt occupying the hypogastric region and sometimes extending as far as the umbilicus; the whole abdomen is tumid and painful when pressed on; the patient is affected with considerable fever; he has frequent inclinations to make water, but all his efforts to accomplish this are unavailing and attended with the most excruciating agony. If relief be not administered, the bladder inflames and mortifies, the urine escapes into the abdomen, and death speedily ensues.

The causes of retention of urine are, atony, paralysis, over distensions, inflammation, or hernia of the bladder; the pressure of the rectum, uterus, tumours, &c., on the neck of the bladder; enlargement of the prostrate gland; inflammation or stricture of the urethra; calculi or other substances lodging in this canal.

The urine should be constantly drawn off by the catheter, and in order to restore the tone of the bladder, cold water should be frequently dashed upon the pelvis, and the patient recommended to take the more stimulating and warmer kinds of diuretics.

If this disease be occasioned by paralysis, the surgeon

should have recourse to the catheter, and at the same time endeavor to remove the original disease upon which the paralytic affection depends. The causes of paralysis of the bladder, are concussions or other injuries of the spinal marrow; it sometimes occurs in paraphlegia.

The treatment proper for the retention of urine arising from over distension is, that the catheter should be introduced to draw off the accumulated fluid, and the contractile power of the bladder restored by the use of cold applications to the hypogastric region, and of blisters to the sacrum.

When retention of urine depends upon inflammation of the bladder, the urine in the first place should be taken away by means of the catheter; the practitioner should then reduce the inflammation by bleeding, the warm bath, warm fomentations, oleaginous purges, glysters and spare diet.

In retention of urine occasioned by hernia of the bladder, the urine should be drawn off by the catheter, the protruded bladder reduced, and a truss applied; if the case be irreducible, the tumour should be supported by a suspensory bandage.

If retention of urine be occasioned by the rectum becoming distended, from piles, alvine concretions, or flatus and pressing upon the neck of the bladder, it can only be effectually relieved by removing the primary disorder. The state of the uterus, which gives rise to retention is, its being gravid, retroversion, or distended from an accumulation of menstrual fluid, or from tumours growing from its internal surface. The treatment in each of these cases consists in repeatedly drawing off the urine by means of a catheter or bougie, until the cause of the retention be removed.

The plan of treatment to be resorted to in retention of

urine arising from foreign bodies lodging in the bladder is this: in the first place a catheter should be introduced to push back the extraneous substance from the internal orifice of the urethra, and at the same time to draw off the urine. If the foreign body be small, it must be extracted through the urethra; if large, its removal can only be accomplished by cutting into the bladder.

When inflammation or enlargement of the prostrate gland occasions retention of urine, the bladder must first of all be emptied of urine by means of the catheter, and then proper measures adopted for the cure of the original complaint; if it be inflammation, recourse should be had to bleeding and other antiphlogistic remedies; if enlargement, frequent bleedings from the loins, mild aperients, opiates, the warm bath and a temperate mode of living are to be recommended.

When retention of urine is occasioned by inflammation, bleeding, the warm bath and emollient injections ought to be prescribed; when from stricture, venesection, the use of warm fomentations and other relaxants should constitute the curative process. In some cases of stricture, it is necessary to introduce the catheter before relief can be obtained; and if the obstruction in the urethra be so great as to prevent the accomplishment of this, the bladder must be punctured. Calculi lodging in the urethra, and causing retention of urine should be extracted or cut out.

CATHETER.

The mode of introducing this instrument is as follows: the patient being laid in the recumbent position on the floor, or on a bed, with his thighs separated and moderately bent on the pelvis, the surgeon lays hold of the

penis between the fingers and thumb of his left hand. He then takes the catheter, previously immersed in warm water and oil, in his right hand, and pushes it with its concavity towards the abdomen gently along the urethra, at the same time stretching forward the penis; as soon as the instrument has reached the bulb of the urethra, the surgeon should suffer the penis to retract; and now slowly depressing the handle of the catheter between the patient's legs towards the anus, he conveys its point into the cavity of the bladder.

The most common causes of impediment to the introduction of the catheter, are the point of instrument becoming entangled in a fold of the internal membrane of the urethra, or in one of its lacunæ; or by its being forced against the os pubis, in consequence of the surgeon too soon depressing its handle.

To overcome these impediments no violence ought on any account to be used, but the catheter should be a little withdrawn and then pushed on in a different direction; if this manœuvre does not succeed, the surgeon should introduce his left fore finger into the rectum and raise the point of the instrument up into the neck of the bladder. There are other obstacles which oppose the free entrance of the catheter into the bladder, such as spasm of the muscles of the perineum, enlargement of the prostrate gland, and stricture of the urethra. The first of these impediments is removed by moderate friction, applied to the part; the second is overcome by employing a catheter the back of which is longer and bent more upwards than those used in ordinary cases; the management necessary for the third we have already considered.

The following is the method of introducing the female catheter. The patient should be placed upon her back with her knees bent and her thighs separated. The

surgeon then passing his left fore finger from the pubes down between the labia pudendi, places its point on the elevated meatus urinarius. This serves as a guide to the catheter, which should be firmly held between the thumb, fore and middle fingers of the right hand. As soon as the instrument is lodged in the urethra, it should be pushed forward in an horizontal direction into the bladder.

PUNCTURING THE BLADDER.

There are three modes of puncturing the bladder, through the rectum, above the pubis, and by the perineum. The first method is considered the most eligible. The others have there advocates, and under certain circumstances are to be preferred.

The method of puncturing the bladder through the rectum is this: the patient must be placed as in the operation of lithotomy; the surgeon then seated in a low chair introduces the fore finger of his left hand into the rectum, carries its extremity beyond the prostrate gland; he now takes a long curved trocar in his right hand, and sliding it along the thenal aspect of the left index finger, he pushes it through the coats of the distended bladder in the triangular space included between the vesiculæ seminales and peritoneum. As soon as the urine begins to flow the stilet should be withdrawn, the canula pushed further up, and retained by means of tape passed round the thighs.

This operation is inadmissible in cases of diseased rectum or enlargement of the prostrate gland.

The mode of puncturing the bladder above the pubis is as follows, the patient must be placed in a reclining position with his thighs bent upon the pelvis. The sur-

geon then makes a small incision between the pyramidales muscles about an inch and a half above the symphysis pubis. He now takes a common trocar, and guiding it by his left index finger introduced into the wound, pushes it obliquely downwards and backwards into the cavity of the bladder; after the stilet is withdrawn and the urine evacuated, the canula should be fixed with proper tapes. In a few days it will be necessary to take away the canula, to prevent incrustations forming upon its surface. Previous to its removal however, an elastic gum catheter should be conveyed through its tube into the bladder.

The disadvantage attending this operation is that the urine owing to the situation of the external wound, cannot readily flow through the canula; it therefore sometimes escapes into the cellular substance and produces inflammation and gangrene.

For puncturing the bladder by the perineum, the patient should be placed as in lithotomy. An assistant presses down the bladder towards the pubes. The surgeon then makes an incision an inch and a half in length on the left side of the raphe of the perineum, between the crus penis and bulb of the urethra. Having laid bare the prostrate gland, he now takes a straight trocar three inches and a half long, and passing it cautiously along the fore finger of his left hand inserted into the wound, pushes it through the coats of the distended bladder.

The objections to puncturing the bladder by the perineum are its being more difficult to execute than either of the above described, and more frequently followed by extravasation of urine into the cellular substance; in performing it too, the surgeon runs great risk of wounding the vas deferens, vesiculæ seminales ureter, prostrate gland or rectum.

LITHOTOMY.

The symptoms indicative of stone in the bladder are an itching or an uneasy sensation in the glans penis, which causes the patient to squeeze and pull forwards the prepuce; pain along the urethra, generally most severe opposite the frænum præputii, always much increased immediately after making water; obtuse pain in the neck of the bladder and lower part of the abdomen, coming on in violent paroxysm, extending to the loins and hypochondria, and greatly aggravated by riding on horseback, or in a carriage; frequent inclination to void urine, which is commonly purulent, sabulous or bloody, particularly after taking exercise and is often discharged by drops or in very small quantities; if it be passed in a full stream, the current is suddenly stopped before the bladder is entirely emptied, but flows again as soon as the position of the body is changed. These symptoms are for the most part accompanied with disorder of the gastric system, fever tenesmus, numbness of the thigh and retraction of the testicle.

The increase of pain which is experienced directly after making water, arises from the internal surface of the bladder coming in close contact with, and embracing the rough surface of the stone.

The sudden stoppage of the urine is to be ascribed to the calculus falling against the internal orifice of the urethra. When the patient alters his position, the calculus is removed into another place and the urine again flows out.

But the symptoms just enumerated may be occasioned by enlargement of the prostrate gland; by inflammation

of the bladder or neighboring parts; by scirrhosity of the bladder, or by tumours growing from its internal surface.

To decide whether a stone really exists in the bladder or not, although the symptoms above mentioned afford strong presumptive evidence of stone in the bladder, yet as they accompany other diseases the existence of a vesical calculus can only be correctly ascertained by means of the sound.

Enlargement of the prostrate gland is to be distinguished from stone in the bladder, by the pain from an enlarged prostrate gland not being increased by the motions of a horse or carriage, never coming on in paroxysms, and is never so acute as that produced by a calculus lodging in the bladder.

The sound is to be introduced precisely in the same manner as a catheter, and it should never be withdrawn from the bladder until it has several times been made to strike the surface of the stone.

If the stone cannot be readily felt, the extremity of the sound, as soon as it has entered the bladder, should be carefully moved about in various directions, and sometimes it will be necessary to introduce the finger into the rectum, and raise up the stone, to bring it within reach of the instrument. The patient should be sounded while placed in different attitudes, and both in the full and empty state of the bladder.

Eleven kinds of urinary calculi have been discovered, viz: the uric acid calculus; the phosphate of lime calculus; the triple or ammoniaco-magnesian phosphate calculus; the fusible calculus; the oxalate of lime or mulberry calculus; the cystic oxyde calculus; the alternating calculus; the compound calculus; the oxanthic oxyde calculus; the prostrate gland calculus; and the fibrinous calculus.

Those most commonly found in the bladder, are the uric acid calculus, the phosphate of lime calculus, the ammoniaco-magnesian phosphate calculus, the oxalate of lime calculus, and the cystic oxyde calculus.

Calculi are generally found loose and movable in the bladder; occasionally, however, they are imbedded in preternatural pouches, or situated between the folds or among the muscular fasciculi of the bladder.

Calculi may exist in the bladder without creating pain or inconvenience; indeed this circumstance has been frequently known to occur, and occasionally small or smooth stones give more pain than large or rough ones.

The effects which are produced on the urinary organs by calculi lodging in the bladder, are inflammation, thickening or ulceration of the coats of this organ, and not unfrequently inflammation, swelling and suppuration of the ureters or kidneys.

Patients about to undergo the operation of lithotomy should be confined for several days to the horizontal posture, directed to live very abstemiously, and to take occasional doses of some mild aperient; in very plethoric habits, venesection will be advisable. An hour before the operation, the rectum should be evacuated by an oleaginous enema.

Lithotomy is more easily performed when the bladder contains a portion of urine; therefore the patient should avoid passing any off for an hour or two before undergoing the operation.

There are three methods of performing lithotomy, by the perineum, above the pubis, and through the rectum; the first is termed the lateral operation, the second the high operation, and the third the posterior or recto-vesical operation.

LATERAL OPERATION WITH THE KNIFE.

After the perineum is shaved, the patient should be laid on a firm table, with his nates projecting somewhat beyond its edge; his head and shoulders should be elevated a little by a pillow, and after the staff is introduced into the bladder and the stone is distinctly felt, his hands and feet should be tied together by means of broad tapes, and his thighs separated by two assistants.

The end of the staff should project about two inches into the bladder, and be made to rest if possible on the stone; its handle should be held nearly in a perpendicular direction, and somewhat inclined towards the right groin. The instrument, when properly adjusted, should be committed to the charge of a steady assistant, who stands on the dextral side of the patient, with his left hand supporting the scrotum. As soon as the surgeon has properly fixed the staff, he should seat himself on a stool of such a height that his breast may be opposite the patient's breech; he should then stretch the integuments of the perineum with the finger and thumb of his left hand, and divide them with one stroke of the scalpel.

The first incision through the integuments must be made on the left side of the raphe of the perineum; commencing nearly an inch and a half above the anus, and a finger's breadth on the mesial or inner side of the ascending ramus of the left ischium, it should be carried obliquely downwards and outwards, between the tuberosity of the ischium and the anus, and made to terminate an inch and a half below the latter.

The length of the external incision in the adult should be about three inches and a half.

The next step of the operation, after the external incision is completed, is for the surgeon to cut between the crus penis and bulb of the urethra; he should then, after pushing the latter on one side with his left fore finger to prevent its being injured, divide the transversalis perinei muscles, the cellular substance and a portion of the levator ani, so as completely to lay bare the membranous part of the urethra; taking especial care during the whole of this dissection to press down the rectum and defend it from the knife, by means of his middle finger introduced into the wound.

In the remaining part of the operation, as soon as the membranous portion of the urethra is laid bare, the operator makes a small incision into it, so as to expose the staff, into the groove of which he immediately inserts the nail of his left fore finger; he now turns the back of his knife upwards, and fixing its point in the groove pushes it onwards through the prostrate gland into the bladder, guiding it all the while by his left index finger placed beneath the cutting edge. When the cavity of the bladder is laid open to a sufficient extent, the knife should be withdrawn, the forceps introduced, the staff removed, and finally the stone laid hold of and extracted.

While cutting through the prostrate gland, the edges of the knife should be inclined obliquely downwards and outwards, but when it has divided the gland and entered the cavity of the bladder, it should be turned in a lateral direction. By this manœuvre the incision is made of a semilunar figure, and sufficiently large to admit of the extraction of a large stone.

The forceps should be kept closed, and conducted along the left index finger, which must be inserted into the wound as soon as the knife is withdrawn.

The staff should not be taken away until the blades of the forceps are fairly lodged in the bladder.

The stone generally lies at its inferior and posterior part. As soon as its situation is discovered, it should be grasped by the forceps in its smallest diameter, and then extracted; if not easily got hold of, it should be raised up by the finger passed into the rectum.

There are sometimes several calculi lodged in the bladder. The surgeon, therefore, as soon as he has extracted one, should pass his fore finger into the bladder, and carefully feel that another does not remain behind; if this happen to be the case, it must be removed in the same manner as the first.

The extraction of the stone is chiefly impeded by its own prodigious bulk, by its being seized with the forceps in a transverse position, by the small size of the wound, and by the contraction of the bladder.

When the stone is of very considerable magnitude, it should be broken, and after the larger pieces are taken away, the smaller fragments should be washed out with tepid water, or removed with the scoop; when grasped in its largest diameter, it should be released from the forceps, and then again laid hold of in a more convenient direction; when the wound is too small, it should be enlarged by a probe pointed bistoury.

If the extraction of the stone is prevented by the bladder spasmodically contracting upon it, the surgeon ought on no account to persist in using any violent measures, but should administer an anodyne, return his patient to bed, and bring away the stone when the parts have become relaxed.

When the stone is imbedded in a cyst, it should first of all be opened by means of a caupe-bride; the surgeon

should then introduce the forceps, lay hold of the stone and extract it.

The parts which are divided in the lateral operation of lithotomy are the skin, cellular membrane, accelerator urinæ, transversus perinæi, and transversus perinæi alter muscles; part of the levator ani, membranous portion of the urethra, prostrate gland, and neck of the bladder.

The artery divided in this operation is the transversa perinæi, a branch of the arteria pudica; it lies under the transversus perinæi muscle.

The arteries which are in danger of being wounded are those of the bulb of the urethra and the common pudic.

The other important parts which may be wounded are the rectum, vesiculæ seminales and fundus of the bladder.

The other dangerous consequences which may arise from the operation of lithotomy is it sometimes being succeeded by peritonitis, or extravasation of urine into the cellular membrane, producing inflammation, suppuration or gangrene.

The operator wounds the artery of the bulb of the urethra, when he begins the external incision too near the arch of the pubis, or more than an inch and a half above the anus.

He wounds the common pudic artery when he cuts too much in a lateral direction in dividing the prostrate gland.

In case of a wound of the common pudic it must either be secured by a ligature, or compressed with a piece of firm sponge introduced into the wound.

Extravasation of urine most commonly happens when the external incision is made too near the arch of the pubis and not carried down sufficiently far beyond the

anus ; it is also sometimes produced by coagulated blood obstructing the opening into the bladder, or by the lips of the wound becoming excessively swollen.

If the urine be observed a few hours after the operation, not to have escaped at the external wound, a free outlet for it should immediately be obtained by introducing the finger into the bladder and dislodging the coagulated blood ; or if necessary, by enlarging the external incision.

After the operation, the patient should be laid in bed, upon his back, the thighs should be bound together, and the wound superficially dressed. All kinds of stimulating food and drink should be prohibited, and if symptoms of peritonitis appear, they must be subdued by the usual remedies.

OPERATION BY A DOUBLE INCISION.

This mode of operating will be found preferable to the former in some cases, from the facility it affords of reaching and extracting the stone.

After the patient is placed as usual, with the staff introduced ; the surgeon must direct the fore finger of his left hand into the rectum, guiding a bistoury, with which is to be divided that portion of the intestine which is embraced or surrounded by the sphincter ani, and carries forward his incision an inch or more along the raphe of the perineum; the membranous part of the urethra should then be divided, being guided by the staff, for the extent of several lines, or to the anterior edge of the prostrate, when he directs one of the blades of a pair of curved scissors, upon the fore finger, into the groove of the staff, and divides the prostrate obliquely upwards and

outwards, on one side; after which the other blade of the scissors is passed along the staff, and the other side of the prostrate divided in the same manner, so that there now results a triangular flap, whose apex points downwards, including a larger or smaller portion of the gland. The forceps are then introduced and the stone extracted.

LATERAL OPERATION WITH THE GORGET.

Many surgeons prefer using this instrument or the bistore cache, to the knife, particularly for old persons, in consequence of greater rigidity of the prostrate gland and bladder. When an opening is made into the membranous part of the urethra, and the break of the gorget is fixed in the groove of the staff; the surgeon then raising from his seat, and taking hold of the handle of the latter instrument with his left hand, he depresses it towards himself and at the same time pushes the former onwards into the bladder.

When the incision is completed, the staff should be withdrawn, the forceps introduced, and the stone extracted.

The gorget is objectionable on the following account: 1. It divides the prostrate gland more at its upper than its lateral part, owing to which, the opening into the bladder is too near the arch of the pubis, and consequently so confined that the extraction of the stone is generally attended with considerable difficulty. 2. It is very apt to wound the pudic artery, the rectum, or fundus of the bladder. 3. It sometimes slips from the groove of the staff, and passes between the bladder and rectum.

OPERATION ABOVE THE PUBES, OR THE HIGH OPERATION.

The usual manner of performing the operation is this. The patient must be laid on a square table, with his thighs somewhat bent on the pelvis, and his back and shoulders well supported by pillows; an incision four inches in length should then be made along the mesial line through the integuments at the inferior part of the abdomen; this lays bare the linea alba, which should be divided in the direction of the external wound for about three inches; the two recti and pyramidales mureles are next to be separated from each other, and the latter a little detached from their origins. The surgeon now passes a sonde á dard along the urethra into the bladder, and pushes the point of the stilet through the coats of this viscus into the external wound; he then fixes a probe-pointed bistoury in the groove of the stilet, and enlarges the opening in the fundus of the bladder by cutting towards the pubis; this being done, the left index finger should immediately be placed between the lips of the incision, to bear up the coats of the bladder, which otherwise would contract and shrink away as soon as the urine had escaped; the sonde á dard should then be withdrawn, the forceps introduced and the stone extracted; after the operation, a piece of simple dressing should be applied to the wound, an elastic gum catheter passed into the bladder, and the patient put to bed.

The disadvantages of the high operation are its frequently being succeeded by peritonitis or extravasation of urine into the cellular membrane, and its difficulty of being performed, or even quite impracticable, when the patient is very fat or the bladder so much thickened and contracted, that its fundus cannot be made to rise

above the pubis. But this operation is to be preferred to the lateral in those cases were large calculi are to be extracted and where the urethra or prostrate gland is in a state of disease.

OPERATION THROUGH THE RECTUM, OR POSTERIOR OPERATION.

The patient being placed as in the lateral operation, a groove staff must be passed along the urethra into the bladder, and held perpendicularly by an assistant, who stands on the sinistral side of the patient. The surgeon now introduces his left fore finger into the rectum, and conveys along its thenal surface, the flat side of a common bistoury; he then turns the sharp edge of the instrument upwards, and drawing towards himself in the direction of the raphe of the perineum, divides the lower part of the rectum and sphincter ani.

This incision lays bare the prostrate gland, beyond which the staff is easily felt through the rectum and bladder; the bistoury should now be again introduced, and as soon as its point is fixed in the groove of the staff, it should be pushed along it, so as to make an opening through the coats of the bladder an inch in length; this being finished the operator withdraws the knife, introduces the forceps and removes the stone.

The parts divided in this operation are the sphincter ani, the lower part of the rectum and posterior part of the prostrate gland, and the inferior part of the bladder.

LITHOTRITY.

Whether we contemplate the sufferings experienced by individuals laboring under stone in the bladder, or the appalling alternative with which the operation for relief by the knife is viewed by individuals generally, or the hazard accompaning it, the recent invention and highly successful application of an instrument for the removal of calculi of the bladder, which indeed promises ere long to supersede, in the majority of cases, the necessity for the use of the knife, must, I am sure, be viewed not only as forming a new era in our science, but a signal blessing to mankind.

We have accounts afforded us of ancient date where calculi have been brought away in fragments by the urethra; but these details, or a knowledge of the rude instruments with which the process was accomplished, could barely have aided in the conception of the lithonthryptic process as now performed; and to the individuals who have thus zealously devoted themselves for years in bringing this science to its present state of perfection, we shall gladly tender the laurels so richly merited.

Though difficult as this operation certainly is, from the complication of the instrument, together with the great risk of doing mischief, which too frequently occurs, and sometimes followed by the worst consequences, the mystery, if any, will be found entirely to vanish by studying and frequently practising the operation; and, indeed, the comparisons which have been made between lithotrity and the operations of the mechanist, unappropriate as they are, yield us some idea of the requisite attention and

practice in the acquirement of manual dexterity in this art.

The apparatus consists of a straight canula, of the diameter of a large sized catheter; within this runs another of steel, the end of which is cleft into branches, the number varying with the instrument; the extremities of these are shaped as claws, for the apprehension of the stone, but so contrived as to obviate as much as possible the risk of pinching the bladder; these branches expand by their own elasticity, either separately or conjointly, when pushed from the manual beyond the confines of the vesical extremity of the canula, and made gradually to close on the stone to the degree of firmness required, either to hold the calculus or to crush it; then reclosing as they are drawn again under the canula: through this inner tube a steel rod may be passed, called the indicator, to ascertain the situation of the calculus, or to adjust it within the claws; which, when accomplished, is to be withdrawn, and succeeded by the evideur, which is an iron rod terminating in a well tempered file, having a ginglymoid joint at some distance from its extremity, and which is actuated by a central stem, and deflected to any angle required; the action of the bow communicated to this will quickly excavate the hardest calculus; the shell thus formed may in most cases be crushed by the united pressure of the mendrin and branches.

At the manual extremity of the apparatus, there are contrivances for preventing the escape of the urine, without impeding the motion of the canula, &c., and for fixing the string of a drill bow.

This operation may be analyzed into the following principles: the position of the patient, which should be that of reclining with the chest slightly supported; the

injection of the bladder, if not already moderately distended with urine; the introduction of a straight sound, for the dilatation of the canal, and ascertaining the exact position of the calculus; passing the lithotritic apparatus, the expansion of its branches, the fixation of the stone in the bladder; its destruction by mechanical means in that organ, and subsequent expulsion of the fragments in the stream of urine.

SCROPHULA.

This is a disease depending upon some peculiarity of constitution yet unknown, which may exist hereditarily or be acquired; the seat of its occurrence is generally in some part of the glandular system, though no structures are exempt.

The most frequent period for its appearance is in childhood, when the glands are its seat, and with them sometimes the eyes.

On the advance of years, there is not only a diminution of the liability to this disease generally, but the susceptibility of the structures to be affected is changed; thus, if it occur after childhood, the lungs are more liable to be its seat, or the bones and joints. It frequently makes its first appearance by affecting the vertebræ of the back, producing the too often fatal disease called lumbal and psoas abscess.

The hereditary predisposition to the disease may lay dormant through life, unless it be roused into action by some circumstances to favor its developement; as from a

residence in a damp, cold climate, and want of due attention to clothing, diet and fresh air, which may be exciting as well as predisposing causes; and more especially whatever tends to produce a state of debility in the constitution, as from fever, which may be scarlatina, small pox or measles, &c., that leads the way for the establishment of scrophula.

If the lungs be the seat of this disease, it tarries there, affording the train of symptoms of phthisis.

Hence may the same predisposing cause give rise to consumption as scrophula, which we frequently see evinced in the same family.

Females are more liable to this affection than males. It is noticed that individuals who are thus predisposed, have generally a fine, soft skin, under which the vessels appear to wander; individuals of a strumous habit, also, have generally a thick upper lip, and of flacid fibre, light hair and eyes.

The usual mode of this disease presenting itself, is by a chronic swelling of some of the glandular structures, marked by its very tardy increase and trivial pain; which if not checked, makes an advance towards suppuration. The thin and curdy character of the discharged fluid is peculiar to scrophula, also the edges of the ulcer being of a shining and purplish red color, and overlapping the wound, the peculiar appearance of which distinguishes it from all others.

In the treatment, much may be accomplished in preventing the occurrence of this disease, by obviating those causes which we have noticed as favoring its production; for by attention to the due performance of the functions of the system, directing appropriate diet, exercise and clothing, we may so far invigorate the constitution, as to

render it impenetrable by it, until the advance of years removes the susceptibility.

When external symptoms of scrophula do present themselves as before noticed, it is generally as an enlargement of the glands, and more frequently of those about the neck. For which we may commence exhibiting occasional small doses of calomel; our aim being to suppress the enlargement, which may sometimes be facilitated by gentle friction, if it be unattended with pain; the use of iodine and continued pressure by means of plaster, sometimes of a mercurial character, or by the application of electricity, or the repeated application of a stream of warm water.

The same free, nutritious diet should be continued, with due attention to the functions of assimilation, as previous to the appearance of the disease. Tonic medicines may often be required, especially if suppuration take place; sea bathing is highly serviceable in many cases of scrophula, or where there is a tendency to it, being used either warm or cold, according to the circumstances of the case. There may be some congestion of an internal organ, which the use of cold water may aggravate; as likewise may the glandular affection itself be materially aggravated from the effects of cold on the surface of the body.

If the tumour proceed towards suppuration, in defiance of our measures, and an ulcer is formed, the applications may as well be of a mild character, as ointment or lotion; the healing is frequently favored by the tone afforded to their edges by adhesive plaster, as strappings, over which gradual pressure should be applied.

DISEASES OF THE ARTERIES.

The arteries are liable to inflammation, ossification, a deposition of pultaceous matter between their muscular and serous coats, dilatation, and aneurism.

ANEURISM.

By this is understood a pulsating tumour occasioned by a preternatural dilatation or rupture of the coats of an artery, and filled with arterial blood.

The blood contained in aneurismal tumours, in some instances, is entirely fluid; in others, partly fluid and partly coagulated, and generally out of the track of the circulation.

There are four kinds of aneurism, namely, true aneurism, false aneurism, varicose aneurism, and aneurism from anastomosis.

TRUE ANEURISM.

True aneurism, during the first stage, consists in a permanent and uniform dilatation of all the coats of an artery; in the second stage, the internal and middle coats ulcerate and give way, and the external alone continues to be dilated into an aneurismal swelling.

This aneurism is divided into two varieties, the circumscribed and the diffused. The former is the most common.

True aneurism most frequently occurs in old age, and the arteries in which it is most common, are the aorta, the iliac, femoral, popliteal, carotid, subclavian and

axillary arteries. It never occurs in the smaller class of arteries.

True external aneurism first commences with a strong pulsation in the situation of a large artery; this is succeeded by the appearance of a small, soft, pulsating tumour, which vanishes upon pressure, but returns as soon as the pressure is removed. In its early stage it is attended with no pain or discoloration of the integuments. As the disease advances, the internal and middle coats of the artery yield under the impulse of the blood; the swelling, now bounded by the external coat alone, rapidly enlarges, its pulsations grow less perceptible, it acquires greater firmness from the increasing coagulation, and is nearly or altogether incapable of being reduced by pressure. The external or cellular arterial coat next gives way, and the blood comes in contact with the sheath of the vessel, which in its turn also is ruptured, or removed by absorption; the tumour now daily increasing, presses upon and destroys the surrounding parts; it obstructs the lymphatic and venous circulation, and compresses the large nerves, in consequence of which, the limb becomes cold, edematous, extremely painful, and sometimes paralytic; at last, the aneurism grows very tense and prominent, a livid spot appears on its surface, its walls then give way, the blood gushes out through the aperture, and the patient is speedily destroyed.

Its principal cause is a diseased or ossified state of the arterial coats. Aneurismal swellings are sometimes occasioned by external violence, but alone is insufficient to produce laceration of the coats of the artery, and cause aneurism, unless they are in a previously unhealthy condition.

The serous coat is the seat of ossification, on which

the ossific matter is usually found deposited in small specks on various parts of its peripheral or outer surface.

The coats of an artery are generally ruptured in a transverse direction; though, in some instances, the rupture is longitudinal.

The medical treatment in true aneurism, consists in bleeding, the exhibition of purgative medicines, in spare diet, rest, and the use of digitalis.

There are two surgical methods of cure; compression and the ligature.

Venesection and other debilitating remedies effect the cure of aneurism, by diminishing the force of the general circulation, and by that means promoting the coagulation of blood in the aneurismal sac, whereby its cavity gradually becomes obliterated.

Compression accomplishes the cure of aneurism in the first place, by its interrupting the influx of blood into the aneurismal sac, and thus causes its cavity to contract. The channel of the artery being obstructed by the pressure, and by the coagulation of blood, after the lapse of a longer or shorter period, becomes entirely impervious; the lateral anastomosing branches then enlarge, and carry on the circulation, the coagula are gradually removed by absorption, and the whole tumour at length disappears.

Compression should always be applied to the artery a few inches above the tumour. It is most successful when employed in the early stage of aneurism, and its operation is greatly assisted by depletion and abstinence. It is quite ineffectual if a large anastomosing branch pass off between the swelling and point of compression, as the influx of fresh blood into the sac must, in this case, still continue as copious as ever.

The ligature is preferable to compression, as it is not only a less painful, but a more speedy and effectual remedy.

The ligature should be applied to the artery either as it enters or passes out from the tumour, and should always be pulled sufficiently tight to divide the internal and middle coats of the vessel. Only one ligature should be used, except when the sac is opened; in this case, two are required, one above and the other below the arterial aperture. The ligature, like compression, proves unsuccessful if a large anastomosing branch be given off betwixt it and the aneurismal sac, or from the sac itself.

If the ligature be applied immediately below the origin of a large lateral branch, there will, in that case, be no coagulum formed, on which account hemorrhage takes place as soon as the ligature has cut its way through the coats of the artery.

The ligature should be removed on the fourth or fifth day after its application.

The artery should be detached as little as possible from its surrounding connexions, and carefully separated from the vessels and nerves that accompany it.

Aneurism is sometimes cured spontaneously, and this is effected by four different processes.

First. Sometimes the aneurismal swelling violently inflames, and falls into gangrene; in this case, the artery partakes of the inflammation, its channel becomes obliterated by coagulating lymph, and the current of blood through the tumour is obstructed; the circulation is then carried on by enlarged anastomosing branches, and a permanent cure is effected. Second. When the cavity of the aneurismal sac has become quite filled with firm coagula, it ceases to have any communication with the

artery from which it arises; no further deposition can therefore take place, the contents of the sac are gradually absorbed, the artery remains pervious, the blood circulates through it as usual, and thus a cure is accomplished. Third. When the successive layers of coagula have completely filled the aneurismal sac, they sometimes continue to be deposited within the artery, so as at length to render its caliber impervious as far as the origin of the next large branches above and below the tumour, in consequence of which, the blood is forced into the collateral branches, and the aneurism cured. Fourth. When the aneurismal tumour presses upon the artery, either above or below the sac, it obstructs its channel, produces adhesions of its sides, and obliterates its cavity; the blood then flows into the lateral anastomosing branches, and a cure takes place.

Nature most commonly effects the cure of aneurism by the third process.

The spontaneous cure of aneurism is assisted by depleting remedies conjoined with a rigorously abstemious regimen.

FALSE ANEURISM.

False aneurism is produced when all the three coats of an artery are punctured or burst, and the blood is effused into the adjoining cellular substance, which becomes distended, and raised into a pulsating tumour.

False aneurism is divided into two kinds; the circumscribed and diffused.

The symptoms of false aneurism do not differ essentially from those of true aneurism. The indications by which to distinguish false from true aneurism are these:

in false aneurism the tumour is less readily made to disappear by pressure, and returns more gradually when the pressure is removed, than in true aneurism; the pulsation of the swelling is also generally more feeble and indistinct, and sooner becomes imperceptible in the former than in the latter species of the disease.

False aneurism requires the same treatment as that already recommended for true aneurism. The operation is more successful in false than true aneurism, because the latter is generally connected with a diseased state of the arterial system.

VARICOSE ANEURISM.

This is produced by transfixing a larger subcutaneous vein, and wounding an artery which lies immediately beneath it, so that a direct and permanent communication is formed between the two vessels, and the arterial blood instead of escaping into the cellular substance, passes with a hissing noise, into the cavity of the vein, and distends it into a tumour.

The tumour, in varicose aneurism, is small, always circumscribed, and of an oblong figure; it vanishes when pressed upon, but instantly reappears as soon as the pressure is removed; instead of a full distinct pulsation, it has a jarring tremulous motion accompanied with a hissing sound; its bulk is diminished by compressing the artery that supplies it; it is attended with no pain, and produces no change of color, nor inflammation of the skin; it enlarges very slowly and often remains stationary for a great number of years.

For the treatment of varicose aneurism, when the case is recent, the tumour small, and both vessels lie above

and close to the bone, compression generally succeeds in effecting a cure; but when the disease is of long standing it is better for the surgeon not to interfere, as the tumour, if left to itself, is seldom productive of inconvenience, or any serious results. If it should be accidentally cut or burst by external violence, the artery should be exposed and tied both above and below the puncture.

Varicose is sometimes complicated with false aneurism arising from the arterial and venous punctures not being exactly in the same direction, so that the arterial blood is injected into the adjoining cellular substance before it enters the vein.

This complication is to be detected by the tumour being at first circumscribed, becoming diffused by its rapidly increasing in size, by its not yielding readily to pressure, and by its being attended with pain and inflammation.

If the false aneurism which is conjoined with the aneurismal varix, be circumscribed, the artery should be laid bare and tied above the tumour; but if it be the diffused kind, the tumour must be opened, and two ligatures applied, one above and the other below the arteria punctures.

ANEURISM FROM ANASTOMOSIS.

By this is understood a pulsating tumour, occasioned by a morbid enlargement of a congeries of the smaller arteries and veins.

This tumour is of a livid color and generally commences in the form of a small pimple which gradually increases, and not unfrequently attains to a considerable magnitude; its pulsation becomes more violent during

exercise, mental agitation, or the flow of the catamenia. If the swelling be not extirpated, its parietes eventually give way, the blood is discharged in great profusion, and the patient, if not destroyed, is exceedingly debilitated.

The causes of aneurism from anastomosis, are for the most part, contusions and other external injuries. Sometimes it is a congenital disease.

The tumour should be removed with the knife; if it be very large, or extirpation seem impracticable, it may be cured by tying the principal arterial trunks which lead to the seat of the disease.

ANEURISM OF THE AORTA.

The parts of the aorta most frequently affected with aneurism, is the arch, and that part of it whence the cœliac artery arises.

The symptoms of aneurism of the thoracic aorta are, the patient's first complaining of violent palpitation in the chest, accompanied with difficult respiration, and irregularity of the pulse. These symptoms are succeeded by the appearance of a pulsating tumour at the upper part of the thorax, which as it increases in size, compresses the trachea, lungs, œsophagus and large thoracic veins; producing incessant coughing, laborious breathing, painful deglutition and lethargy.

If it acquires a very enormous bulk, it dislocates by its pressure the ends of the clavicles, and forces its way through the ribs and sternum; in some instances it even destroys the vertebræ, and affects the spinal marrow; when it bursts internally, the blood is effused either into the cavity of the chest, or pericardium; into the œsophagus; the trachea; air cells of the lungs or into the right

auricle of the heart; and the patient expires instantaneously.

The swelling sometimes bursts externally.

Diseases of the lungs and œsophagus, carotid aneurism and aneurism of the arteria innominata may be mistaken for thoracic aneurism. The symptoms of thoracic aneurism in the early stage of the disease are very similar to those of phthisis pulmonalis.

The symptoms of aneurism of the abdominal aorta are its commencing with a violent beating and pain in the belly, accompanied with disorder of the abdominal viscera, and difficulty of breathing; at length a large pulsating swelling appears externally; the patient becomes affected with anasarca; incontinence of urine; and sometimes with paralysis of the lower extremities, and generally dies before the walls of the aneurism give way.

When aneurism of the abdominal aorta bursts, the blood is effused into the stomach, duodenum, or between the layers of the mesentery.

Aneurisms of the aorta have frequently been cured by repeated venesection and the use of purgatives, in conjunction with a temperate mode of living and confinement to bed.

DIRECTIONS FOR TYING THE PRINCIPAL ARTERIES.

TO TIE THE CAROTID ARTERY.

This artery in its passage from the thorax to the head, runs by the side of the trachea. The internal jugular vein is situated on its lateral or outer aspect; behind it lie the par vagum and great sympathetic nerves; the descendens noni is before it. At the lower and middle part of the neck it is concealed by the sterno-cleido-mastoideus muscle; at the atlantal or upper part it is covered only by the skin, platysma myoides, glands, and cellular membrane.

The following is the method of tying the carotid artery. The surgeon should commence his incision opposite the upper part of the thyroid cartilage, and continue it towards the sternum, along the mesial or inner border of the sterno-cleido-mastoideus muscle for about three inches. After the integuments and platysma myoides are divided, the omo-hyoideus, which crosses the lower angle of the wound, should be separated from the sterno-cleido-mastoideus.

An assistant should now compress and draw aside the internal jugular vein, while the surgeon opens the sheath of the artery on its tracheal or inner aspect.

The ligature should be passed under the artery from the lateral or outer, to the tracheal or inner side of the vessel.

THE SUBCLAVIAN ARTERY.

The subclavian artery may be tied in two situations; above and below the clavicle.

The situation of this artery above the clavicle is as follows: the vessel at this part after having emerged from between the anterior and middle scaleni muscles, runs beneath the subclavian to get to the axilla.

It is covered by the skin, platysma myoides and cellular membrane; the cervical nerves are situated above and somewhat behind it; the subclavian vein passes along its sternal or anterior aspect, and is separated from it by the anterior scalenus muscle.

To tie the subclavian artery above the clavicle, a line should be drawn above that bone from its sternal to its acromial extremity. Along this line the first incision must be made; it should commence at the lateral or outer margin of the clavicular origin of the sterno-cleido-mastoideus, and terminate at the edge of the trapezius, where this muscle is inserted into the clavicle; after the integuments are divided the surgeon should next cut through the platysma myoides, taking care not to wound the external jugular vein, which ought to be drawn aside with a blunt hook; he should then dissect with the handle of his knife through the cellular membrane in the middle of the wound; as soon as he has reached the anterior scalenus muscle, he should glide his finger along its lateral or outer margin, down to the first rib, where he feels the artery and ties it.

The artery can be tied on the inner or tracheal side of the anterior scalenus muscle, though the operation is, however, a very dangerous one and difficult to perform, and has hitherto proved unsuccessful.

The important parts which surround the subclavian artery on the tracheal side of the scalenus muscle, are the pleura, which lies close in contact with it; and the vertebral, inferior thyroid and internal mammary arteries, which are situated in its immediate vicinity; the par vagum, phrenic nerve, and subclavian vein pass before it; behind it is the lower cervical sympathetic ganglion; on the dextral side, the recurrent nerve encircles it; on the left this nerve runs between it and the œsophagus; on the left side, the thoracic duct also descends over the subclavian artery.

The situation of the subclavian artery below the clavicle is this: the vessel after it has escaped from under that bone passes behind or on the dorsal aspect of the pectoralis minor, not far from the insertion of the muscle. The subclavian vein runs before and a little below the artery; one of the cervical nerves lies above and the rest behind it.

In the usual manner of tying the subclavian artery below the clavicle a semilunar incision, having its convexity downwards, should be made through the integuments, covering the clavicular portion of the pectoralis major; commencing an inch from the sternal extremity of the clavicle, and terminating just before the thenal or anterior margin of the deltoid-muscle; as soon as the fibres of the pectoralis major are exposed, they should be divided and reflected upwards. This part of the operation brings into view the pectoralis minor which crosses the lateral or outer angle of the wound. In the space between the upper edge of the pectoralis minor and the clavicle, the artery should be laid hold of and tied; care being taken to separate the vessel well from the surrounding parts before applying the ligature. The cephalic vein may be wounded in the first incision if care be not taken.

AXILLARY ARTERY.

The axillary artery is surrounded by the axillary plexus of nerves, which is situated immediately under the integuments of the arm-pit.

For tying the axillary artery; the patients' arm being raised, an incision three inches in length should be made through the integuments, exactly over the middle of the head of the os brachii; the axillary vein first presents itself, then the median nerve, behind which is the artery; the vessel, before it is included in the ligature, should be carefully freed from the important parts adjoining it by the handle of the knife.

BRACHIAL ARTERY.

This artery, a little above the elbow, lies under the skin and fascia, between its two venæ comites, close to the inner edge of the biceps flexor cubiti muscle. The triceps extensor cubiti is situated on its anconal or posterior aspect; on its ulnar side is the median or radial nerve, and near to this is the vena basilica.

For the operation of tying the brachial artery, the surgeon should commence his incision three fingers' breadth above the inner condyle of the humerus, and extend it upwards towards the axilla, along the inner edge of the biceps flexor muscle, for about two inches and a half.

The artery is found immediately beneath the fascia, in the situation above described. The aneurismal needle in being passed under the brachial artery should be directed from the ulnar or inner, to the radial or outer side, in order to avoid including the median nerve in the ligature.

THE ULNAR ARTERY.

At the upper third of the fore arm this vessel runs between the flexor digitorum sublimis and the flexor digitorum profundus, the former being situated on its thenal or anterior, and the latter on its anconal or posterior aspect; the flexor longus pallicis, lies on its radial, and the flexor carpi ulnaris on its ulnar side. The ulnar nerve passes down along the ulnar side of the artery.

The proper manner of tying the ulnar artery at the upper third of the fore arm is this; the surgeon should begin his incision two inches below the ulnar condyle of the humerus, near the inner edge of the ulnar,and carry it downwards in a straight direction, for about three inches; as soon as the integuments and fascia are divided, the palmaris longus presents itself, and beneath this is the flexor digitorum sublimis; the ulnar or inner edges of these two muscles, which lie on the outer side of the wound, after being separated from the radial or outer edge of the flexor carpi ulnaris, which lies on its inner side, are to be somewhat raised, when the artery will be brought into view.

The ulnar artery at the wrist lies covered by the skin and fascia, between the tendon of the flexor digitorum profundus, and the flexor carpi ulnaris; the former muscle being situated on its radial or outer, the latter on its ulnar or inner side. The ulnar nerve runs along the ulnar or inner side of the artery, inclining a little to its anconal or posterior aspect.

The method of tying the ulnar artery at the wrist is this: the operator should commence his incision half an inch above the os pisiforme, and continue it upwards,

along the radial or outer margin of the flexor carpi ulnaris, to the extent of three inches.

The artery is found immediately under the fascia in the situation above described.

THE RADIAL ARTERY.

This artery, at the upper third of the fore arm, has the superiator radii longus on its outer, and the flexor carpi radialis on its inner side, and is covered by the ulnar margin of the former muscle; the pronator radii teres, which it crosses, and the flexor digitorum sublimis, and flexor longus pollicis, lie immediately behind it. The superficial branch of the spiral nerve runs on its radial or outer side.

In the operation for tying the radial artery at the upper third of the fore arm, the surgeon should begin his incision just below the insertion of the tendon of the biceps flexor cubiti and extend it obliquely downwards and outwards, for three inches, exactly in the interspace, between the supinator radii longus and flexor carpi radialis. After the integuments and fascia are divided, the ulnar or inner edge of the long supinator should be raised, and drawn a little outwards; this will expose the artery, which must be carefully separated from its accompanying veins and nerve, before the ligature is applied.

At the wrist this vessel is covered merely by the skin and fascia, and runs on the radial or outer side of the flexor carpi radialis muscle, and close to the thenal or anterior aspect of the radius. A twig of the musculocutaneous or perforans casserii nerve is situated near to the artery. It is not included in the same sheath with the artery, but runs between the integuments and fascia·

In the operation for tying the radial artery, the first incision should commence at the styloid process of the radius, and be continued upwards towards the elbow, for two inches along the outer side of the flexor carpi radialis. Its upper extremity will pass a short way on the ulnar or inner margin of the tendon of the supinator radii longus; as soon as the integuments are divided, the operator should carefully lay open the subjacent fascia, immediately beneath which the artery is found.

INTERNAL ILIAC ARTERY.

This large vessel descends behind the peritoneum, along the edge of the sacrum into the pelvis. The internal iliac vein is situated on its lateral or outer aspect.

The operation of tying the internal iliac artery should be commenced by making an incision five inches in length through the integuments and superfical fascia, on the anterior and lateral part of the abdomen, parallel with and half an inch on the iliac or outer side of the epigastric artery. This exposes the tendon of the external oblique muscle, which should next be divided in the direction of the outer wound. The operator then passing his finger beneath the inferior border of the internal, oblique and transversalis muscles, slits them both up with a probe pointed bistoury; he next separates the peritoneum from the surface of the iliacus internus and psoas magnus and pushing it towards the mesial line, feels the artery in the situation above mentioned.

EXTERNAL ILIAC ARTERY.

The external iliac artery passes down behind the peritoneum, along the mesial or inner border of the psoas

magnus. The external iliac vein lies close to its mesial or inner aspect. The crural nerve is situated on its lateral or outer aspect, and separated from it by the psoas muscle.

For tying the external iliac, a semilunar incision, three or four inches in length, should be made through the integuments and fascia at the lateral and lower part of the abdomen; it should commence a short way below, and on the mesial side of the superior anterior spinous process of the os ilium and be continued a little above, and in the direction of Poupart's ligament, so as finally to terminate at the upper part of the inner pillar of the external abdominal ring; this lays bare the tendon of the oblique externus muscle, which should next be divided thoughout the extent of the first incision.

The flap thus formed being reflected, brings into view the inferior margins of the obliquus internus and transversalis, which are to be turned up with the handle of the knife; the surgeon then passing his finger behind the spermatic cord, pushes aside the peritoneum, on the dorsal aspect of which the artery is situated in the manner already described.

FEMORAL ARTERY.

The femoral artery at the groin is covered by the skin, fascia superficialis, inguinal glands, fascia lata, and adipose membrane; and rests upon the rotular or anterior surface of the common termination of the psoas magnus and iliacus internus muscles; it has the sartorius and rectus femoris, on its outer, and the pectinalis and triceps adductor, on its inner side; the femoral vein passes along

its tibial or inner, and the anterior crural nerve on its fibular or outer aspect.

In laying bare the femoral artery at the groin the incision should begin a little below the middle of Poupart's ligament, and carried obliquely downwards for about three inches; the artery is found beneath the fascia as above mentioned.

The situation of the femoral artery at the middle of the thigh is as follows: being here invested in a strong sheath of condensed cellular membrane, and covered by the common integuments, fascia and sartorious muscle; it runs over the pectinalis, part of the adductor brevis, the whole of the adductor magnus, and a small portion of the adductor longus, and seems lodged in a groove formed by the insertion of these muscles and the origin of the vastus internus, which lies on its fibular or outer aspect. The femoral vein is situated on its inner and posterior side; on its outer and anterior aspect, is the saphena nerve, a branch of the anterior crural.

The operation of tying the femoral artery at the middle of the thigh is as follows. The patient must be laid in the horizontal position with his knees half bent, and his toes turned inwards; the surgeon then divides the skin and cellular membrane a little above the middle of the thigh, commencing his incision two inches below Poupart's ligament, and continuing it obliquely downwards in the direction of the sartorius muscle for about three inches; having cut through the integuments, he next opens in the middle of the external wound, the subjacent fascia lata, to the extent of an inch and a half; this exposes the sartorius, the inner edge of which must be reflected outwards, when the sheath of the femoral artery

presents itself, and requires to be carefully opened before the ligature is applied.

POPLITEAL ARTERY.

This vessel has the condyles of the os femoris, and the heads of the gastrocnemius externus on each side of it; it rests upon the capsular ligament of the knee joint and popliteus muscle; and is covered by tendinous fascia, the popliteal nerve and vein, and by adipose membrane.

The method of tying the popliteal artery is this: an incision three inches in length should be made between the condyles of the os femoris; as soon as the integuments and fascia are divided the popliteal nerve presents itself, the popliteal vein next appears, beneath which is the artery, imbedded in a quantity of adipose membrane.

ANTERIOR TIBIAL ARTERY.

The anterior tibial artery a little above the middle of the leg runs down on the rotula or anterior surface of the interosseous ligament, between the tibialis anticus and extensor longus digitorum, the former muscle being situated on its tibial or inner, and the latter on its fibular or outer side.

In the operation of tying the anterior tibial artery a little above the middle of the leg, an incision should begin a short distance above the middle, and be continued downwards a finger's breadth on the fibular or outer side of the spine of the tibia for three or four inches; after the integuments and fascia are divided the tibialis anticus and extensor longus digitorum should be separated from each other; between these two muscles, at the depth of an inch, the artery is found.

The method of tying the anterior tibial artery just after it appears on the interosseous ligament is this: the surgeon should commence his incision an inch below the head of the fibula, and continue it downwards along the tibial or inner edge of the bone for about four inches; after having cut through the skin and fascia, he should then separate the peroneus longus and the extensor communis digitorum muscles from each other, deeper between which, on the interosseous ligament, the artery is situated.

POSTERIOR TIBIAL ARTERY.

This artery at the upper part of the leg runs between the two heads of the soleus, and rests upon the proximal or upper part of the tibialis posticus; it is covered by a strong aponeurosis, and by the plantaris, and gastrocnemius muscles, and has the posterior tibial nerve behind it; in other words, the posterior tibial artery has the outer and larger origin of the soleus on its fibular, and the smaller origin of the same muscle, on its tibial side; the tibialis posticus lies on its rotular or anterior aspect; and the aponeurosis of the leg, the plantaris and gastrocnemius externus are situated on its popliteal or posterior aspect.

The method of tying the posterior tibial artery at the upper part of the leg is as follows: the first incision should commence a little below the condyles of the os femoris, and be continued downwards exactly in the middle of the calf of the leg for about three inches; as soon as the skin, fascia and gastrocnemius externus are divided the plantaris muscle which next presents itself should be raised

and reflected tibiad or inwards. An incision is then to be made along the inner edge of the outer origin of the soleus, through the aponeurosis, immediately beneath which the artery is situated.

The posterior tibial artery below the middle of the leg lies under the soleus muscle covered by the thick aponeurosis which separates the superficial from the deep seated muscles of the leg; it rests upon the popliteal or posterior surface of the bellies of the tibialis posticus and extensor longus digitorum; and has the posterior tibial nerve on its fibular aspect, and a vein on each side.

In the operation of tying the posterior tibial artery below the middle of the leg, the surgeon should begin his first incision a little below the middle of the leg and carry it obliquely downwards for three or four inches along the tibial or inner edge of the gastrocnemius externus; this muscle should then be raised and reflected fibulad or outwards, in order to expose the soleus, the fibres of which are next to be divided; this brings into view the strong aponeurosis or membranous fascia, immediately beneath which the artery is found invested in a sheath of cellular tissue.

The posterior tibial artery at the ancle is lodged in the sinuosity of the os calcis, between the tendo-achilles and malleolus internus; it is covered by the common integuments and tendinous fascia, and has a vein on each side; the posterior tibial nerve runs behind it; the tendons of the tibialis posticus and flexor longus digitorum, are situated on its rotular or anterior aspect; and the flexor longus pollicis passes down on its popliteal or posterior aspect.

At the ancle the vessel is so superficial that it can

readily be exposed, in order to tie it; the first incision should be made somewhat nearer the malleolus internus, than the tuberosity of the os calcis.

DISEASES OF THE VEINS.

They are subject to inflammation, varix, scirrhus and ossification. The two last are very rare.

PHLEBITIES.

The indications of inflammation of a vein, are a red streak appearing on the integuments, in the course of the inflamed vessel, and the surrounding parts become swollen and painful. The patient at the same time is affected with severe constitutional irritation.

The causes of phlebities are punctures, the application of ligatures, &c.

Phlebities terminates if slight in an effusion of coagulable lymph, and consequent adhesion at the opposite sides of the vein; if violent it terminates in suppuration. Sometimes it extends along the internal membrane of the vessel into the cavity of the heart.

It is to be subdued by purgatives, antimonials, diaphoretics, and diluents; the local remedies are leeches, warm fomentations, and saturnine lotions.

The inflammation is to be prevented from spreading to the heart by the application of a firm compress to the vein a short distance above the wounded part. The pressure causes adhesion of the sides of the vessel, whereby the extension of the inflammation is obstructed.

If the vein has suppurated the vessel should be divided, that the purulent matter may be discharged and prevented mixing with the blood.

VARIX.

This is a small, soft, dark-colored, unequal swelling; caused by a preternatural dilatation and thickening of the coats of a vein.

When a vein becomes varicose, the calibre is not only enlarged, and the coats thickened, but it becomes lengthened, tortuous and knotty; the blood circulates through it very slowly, and sometimes even coagulates. Varices occasionally burst, and an extravasation of blood takes place, and when situated in the extremities, they are frequently attended with pain, œdema and numbness of the affected limb.

Varices occur in any part of the venous system, but more frequently in the superficial than in the deep-seated veins; they occur oftener in the veins of the extremities than in those of the trunk; and in the veins of the inferoir than in those of the superior extremities.

The veins which are particularly subject to varix, are the venæ saphenæ, the spermatic and the hemorrhoidal veins.

The cause of varix is pressure, obstructing the venous circulation, violent sprain, spasm, &c. The complaint sometimes appears spontaneously.

Varicose state of the vein is to be treated by moderate and continued pressure, where this can be properly applied; rest and the use of cold lotions afford the most effectual relief. In some cases the diseased veins require to be cut out or divided.

The method of dividing a varicose vein is by introducing a small bistoury, having a convex, cutting edge, flat between the integument and the vein; then turning the edge of the instruments backwards, and cutting the vein completely across. The hemorrhage which succeeds the division of the vessel, should be checked by compress and bandage.

BLEEDING.

Venesection is usually performed on the veins at the bend of the arm, on the vena saphena major, and on the external jugular vein.

The veins at the bend of the arm are the basilic, the cephalic, the median, the median-basilic, and the median-cephalic. Of these, the median-cephalic is the largest.

The brachial artery lies under the median-basilic vein.

The ill consequences which sometimes result from bleeding at the arm are ecchymosis, inflammation of the skin and cellular membrane, inflammation of the fascia and absorbents, inflammation of the vein, wound of the nerve, wound of the brachial artery.

The following is the manner of opening the external jugular vein. The patient being seated in a chair, with his head reclining backwards, and his face turned towards the opposite side, the surgeon compresses the vein with the thumb of his left hand, against the edge of the mastoid muscle; he then takes the lancet in his right hand, and as soon as the vessel appears sufficiently distended, he punctures it in the direction of the fibres of the platysma ingoides, a short distance above the point of compression.

When a sufficient quantity of blood has been taken away, the wound should be closed by a strip of adhesive plaster.

The operation of arteriotomy is performed upon the temporal artery.

The course of the temporal artery is this — from the external carotid it runs between the meatus auditorius externus and root of the zygomatic process; after giving off several branches to the face and parotid gland, it divides nearly opposite the outer angle of the eye, into two branches, the anterior and the posterior; the former runs along the upper and lateral part of the forehead; the latter passes obliquely upwards and backwards towards the occiput.

The temporal artery is not situated beneath the fascia, but runs on the peripheral or outer surface of the aponeurosis of the temporal muscle, and is covered only by the common integuments.

DISEASES OF THE BONES.

CARIES.

This is ulceration of the bones. Caries of a bone and ulceration of the soft parts, bearing so strong analogy to each other; the difference, indeed, between these two diseases is considered to arise merely from the different structure of the parts in which they exist.

In the commencement of the disease, an obtuse, deep-seated pain is felt in the affected limb, and the superin-

cumbent integuments are discolored, tender and flabby to the touch; the soft parts at length ulcerate, and a sinus is formed, which runs down to the caries, and discharges a dark-colored, offensive, ichorous matter. The diseased portion of bone itself is generally soft, moist and perforated with numerous holes, from which spongy granulations arise; sometimes it is dry and of a pale white color.

All the bones are susceptible of being affected by caries; though it most commonly occurs in those of a spongy texture, namely, the sternum, vertebræ, bones of carpus and tarsus, and the extremities of the long bones.

The local causes of caries are inflammation of the bones, violent contusions, and the pressure of tumours; the general or constitutional causes are syphilis, scrophula and scurvy.

The bones which most frequently become carious from syphilis, are the tibia, the bones of the cranium, the sternum, the palate and the nasal bones.

The tibia and inferior maxillary, from scurvy.

The vertebræ, the bones of the carpus and the tarsus, and the extremities of the long bones, from scrophula.

Caries arising from a constitutional cause, is the most difficult of cure. Caries arising from scrophula is more difficult of cure than that arising from scurvy or syphilis; and caries of the spongy bones is more dangerous and difficult of removing than that of compact ones.

Caries is attended with the greatest danger when it exists in the bones of the cranium, in the vertebræ, in the bones of the carpus and the tarsus, and in the large joints.

In some cases the complaint may be checked, and the absorption or exfoliation of the diseased portion of bone

effected, by means of blisters and caustic issues. In others, the carious part requires to be exposed and then cut away by a trephine, circular saw or chisel. When caries arises from syphilis, mercury should be administered; when from scurvy, vegetable diet and citric acid. In scrophulous caries, aperients, tonics and country air and nutritious food ought to be prescribed. Amputation is required in extensive caries of the large joints, accompanied with hectic symptoms.

NECROSIS.

When a portion of bone is deprived of its vitality and then becomes detached from the living part, necrosis is said to have taken place.

This is produced by the periosteum from some cause or other becoming inflamed; it then suppurates, and this suppuration causes it to separate from the bone; the bone now, in consequence of its nutritious arteries being destroyed, soon perishes; the dead portion is then thrown off from the living parts, and after a longer or shorter period, is either absorbed or discharged externally at the surface.

When necrosis arises from a morbid affection of the membrana medullarius, the bone lacks nourishment and dies; it then acts as a foreign body, and causes the periosteum to inflame, suppurate, and ultimately to separate from its surface, and the living bone at length throws off the dead part, which is either removed by absorbents or escapes through fistulous openings formed in the superincumbent integuments.

As soon as the periosteum is detached from the bone, the membrane soon resumes its healthy action, granula-

tions spring up from its internal surface, and a new bone which at first consists of a mere osseous shell, is in a short time produced.

The new bone incases the original one, but openings form in various parts of it, to allow the sequestra to escape. Sequestra is a name given to the dead portions of bone in necrosis.

As the old bone disappears, the new one proportionally increases in thickness; at last, it becomes perfectly solid, and for a time remains in this state; it then begins to be cancellated on its central part, and eventually acquires the appearance and structure of the original one. The old bone, although separated from the periosteum, never relinquishes its attachment to the epiphyses, until the new bone has acquired sufficient strength and solidity to support the action of the muscles inserted into it.

The diaphysis or shaft of the bone is generally the seat of necrosis. The epiphyses or articulating ends of the bone, on account of their great vascularity, and their receiving nutritious vessels from other sources than the periosteum, are seldom affected with the disease.

All bones are liable to necrosis; but the tibia, femur, clavicle, humerus, maxilla inferior, radius and ulna, are those which it most commonly attacks.

All bones are regenerated except those of the cranium and those of the carpus and the tarsus.

The circumstances which impede the process of regeneration, are old age, pregnancy, lues venerea, cancer and rickets.

As soon as the inflammation which attends this disease is subdued by suitable antiphlogistic remedies, blisters should be applied to promote the absorption of the sequestra. If these present at the fistulous opening and are

loose, they must be removed; if they be firmly fixed, they should be allowed to remain a short time longer, unless they produce violent constitutional irritation; in this case, they ought to be exposed and cut away by means of trephines, saws, chisels, &c. When necrosis is very extensive, and the patient's strength is exhausted by the pain, and profuse discharge, and hectic fever, the affected limb must be amputated.

EXOSTOSIS.

This is a hard tumour consisting of osseous matter, and generally growing from a bone on the periosteum.

Exostosis is divided into four kinds, the fungous and the cartilaginous, the periosteal and the medullary.

The bones most subject to this disease are the femur, the tibia, the bones of the cranium, the maxilla inferior, the sternum, the humerus, the radius, the ulna, and the bones of the carpus.

The local causes of exostosis are external injuries; the general ones are scrophula, lues and scurvy.

The most dangerous kind of exostosis is the fungous medullary kind. It is of a very malignant character, and in some particulars bears a resemblance to fungous hœmatodes. Amputation affords the only means of removing it.

The next most dangerous kinds of exostosis, are the cartilaginous medullary, and the fungous periosteal. These in their early stage should be laid bare and extirpated by means of saws, &c.; if left to run their course they generally produce such extensive disease, that nothing but amputation can give relief.

The least formidable species of exostosis is the carti-

laginous periosteal. It is extremely hard, and slow in its growth; when small and recent, it may be dispersed by the use of repeated blisters; when large and in the advanced stage, it requires to be cut away. Venereal nodes are a kind of periosteal exostosis.

The bones which venereal nodes chiefly affect, are those of the cranium, the tibia, the clavicle, and all such as are thinly covered with soft parts.

OSTEOSARCOMA.

This is the conversion of bone into a substance very similar in appearance and consistency to lard or fat.

The bones most subject to this disease are those of the cranium, the bones of the face, the ossa inonminatæ and the long bones of the extremities.

Amputation is the sole remedy in osteosarcoma; and even this is not always attended with a favorable result.

RACHITIS.

The head in this disease is preternaturally large, the sternum prominent, and the abdomen tumid; the ribs are depressed, the epiphysis swollen, and the bones and vertebral column distorted; the muscles are flaccid, and the urine deposits a calcareous sediment; these symptoms are accompanied with low fever, disorder of the bowels, cough, difficult respiration and sallowness of the countenance.

Rachitis seldom appears more early than nine months; or later than two years after birth.

The proximate cause of rachitis is a deficiency of phosphate of lime in the bones.

The remote cause, is impure air, indigestible food,

want of cleanliness, &c. The best remedies are nutritious diet, cleanliness, aperients, tonics, phosphate of lime, cold bathing and friction to the skin.

MOLLITIES.

In mollities the bones are so soft and flexible th at they can be bent in any direction. The disease is attended with no pain. It most commonly occurs in adults, and attacks women more frequently than men.

The proximate cause of mollities ossium is the same as that of rachities.

The patient should be recommended to rest on a firm mattrass, and to persevere in the use of tonic medicines. The complaint is generally incurable.

FRAGILITAS.

In this peculiar affection, the bones are so exceedingly brittle, that they are fractured by the slightest injuries, or by the action of the muscles alone.

The proximate cause of fragilitas is a deficient quantity of gelatin, or a preternatural accumulation of osseous matter in the bones; its remote causes are old age, lues, cancer, and scurvy. Treatment consists in the liberal use of tonics, or in some cases, of mineral acids.

DEFORMITIES OF THE SPINE.

CURVATURE FORWARDS.

This is produced by a weakened state of the muscles of the spinal column by which it loses its due support, and may occur merely as a local circumstance, as frequently resulting from their being deprived of full exercise, as by the sedentary habits of individuals, or the dress of females in restraining the free energy of the trunk. Or the muscles of the spine may participate with a want of tone in the muscular system generally.

This kind of deformity may also be the result of a deficiency of ossific matter in the vertebræ themselves.

Curvature forwards is distinguished from others by the gradualness of its slope, and occupying a greater extent of the column, which is indeed sometimes the whole.

TRUE CURVATURE

Is a projection from within outwards of an angular form and varying in extent and prominence according to the number and situation of the vertebra which are or have been affected, though it is generally limited to a few.

The disease which gives rise to these displacements is of a peculiar character, affecting the calcareous structure of the vertebra, or by ulcerating the intervertebral substance ; occurring at any part of the column, and then communicating the disease to the adjoining structures.

The ligaments sympathizing with the morbid action,

lose their influence over the vertebra, which consequently soon slide from their proper situation in the column, in a direction backwards, being there the least resistance.

Constitutional disturbance is sometimes produced even at the commencement, though the real cause may be unknown; as the morbid action often proceeds in the spine quite unaccompanied with pain, and is merely known by its effects to exist, as by the displacement of the vertebræ indicating that the mischief had been advancing.

There is sometimes pain experienced, particularly on pressing one, two or three of the vertebræ when affected, or there may be loss of power in the parts below the seat of mischief at an early period.

LATERAL CURVATURE

Does not generally arise from a caries of the bones, though it sometimes proceeds from that cause, as also from want of ossific matter.

The curve is usually inclined to the right side, though it may bend to both approaching in form to the letter S inverted.

Its inclination to the right side frequently proceeds from an unequal action of the muscles of the two sides, as may arise from some particular occupation of the individual; an enfeebled state of the muscles, rendering the spine inadequate to the support of the weight allotted to it, is the most frequent cause.

The treatment of spinal affection of course will depend upon the nature of the case; if it be the first kind of deformity and attended to early, by the removal of those causes which has favored its production, relieving the spine of the weight of the head and chest by an apparatus for

the purpose, or a horizontal position, until the muscles and constitution are invigorated, will usually be succeeded by a gradual return of the natural form of the spine.

If it be the second kind or that in which there exists a diseased state of the vertebræ themselves, previous, and sometimes present for a period subsequent to the displacement, as may be evinced by the presence of pain on pressure, much may be done in checking the diseased action, and consequently the additional displacement, by an early discovery of the mischief; enjoining rest in a horizontal position, exciting a discharge on each side of the affected vertebræ by seatons or issues and attention to diet, &c. &c.

FRACTURES.

From the direction in which these extend they are divided into transverse, oblique, and longitudinal: they are also divided into simple, compound, complicated, and comminuted.

By simple fractures is understood a solution in the continuity of a bone, unaccompanied with any wound of the soft parts, caused by the protrusion of the extremities of the fragments.

A fracture is termed compound, when the bone is not only divided, but the extremity of one or both fragments protrudes through the integuments, causing an external wound.

Fracture is termed complicated, when it is attended with a wound of a large artery; with extensive lacera-

tion of the soft parts or with dislocation of a joint; and comminuted when the bone is divided into several pieces.

The principal causes of fractures are external injuries and the violent action of the muscles.

The symptoms of fracture are pain, swelling, deformity, and sometimes shortening of the limb; loss of motion, and crepitus on rubbing the broken pieces of bone together.

The prognosis of fracture is unfavorable when the fracture extends into or is situated near a joint; when it is accompanied with severe contusion or laceration of the soft part, or with the wound of a large artery; when it is compound; and when it occurs in an aged or debilitated person.

The two fragments are most displaced in oblique fractures. In transverse ones, the ends of the broken bone generally remain more or less in contact, and the limb is not shortened; but in oblique fractures, they slide past each other, and the length of the limb is diminished.

The distal or inferior fragments is commonly most displaced. The proximal or upper fragment usually remains, but little removed from its natural situation.

Displacement of the fragments is produced, by the action of the muscle inserted into them, by the weight of the limb, by the violence which caused the fracture, and by the weight of the body.

In the treatment of simple fractures the limb should be placed in such a position as will most effectually relax the principal muscles attached to the fractured bone; it should then be gradually extended so that the extremities of the upper and lower fragments may be brought into accurate apposition; this being accom-

plished, splints and bandages should be applied to prevent the fragments again becoming displaced, and proper measures at the same time adapted to reduce the inflammation.

In fractures complicated with a wounded artery, or a dislocated joint, before the fracture is set the artery should be tied, and the luxation reduced.

In cases of compound fracture if the case be not such as to require immediate amputation, the protruded extremities of the fractured bone should be restored to their natural situation as speedily as possible; the surgeon should then place them in coaptation, lay the limb in splints, apply proper bandages, endeavor to heal the external wound by first intention, and to subdue the inflammation by antiphlogistic remedies.

For the replacement of the protruded bone in compound fracture, the limb should be bent and the muscles put into a state of relaxation; extension and counter-extension should be made, in that direction, in which the wound appears to be most dilated.

If the protruded end of the bone cannot be reduced by the above method, the wound should be enlarged by a scalpel, or a portion of the protruded bone sawed off.

The most preferable plan is to enlarge the wound. In some cases however, as for example, in very oblique compound fractures of the tibia, it is most advisable to remove a part of the exposed bone.

The fragment generally protruded is the proximal or upper one.

Compound fracture most commonly occurs in the tibia and femur.

The causes which prevent re-union of fractures, are constant motion of the limb, old age, pregnancy, debility,

scurvy, &c. The result of fractures not reuniting is the formation of false joints; and this most frequently appears in the humerus and fermur. They are remedied by rubbing the ends of the fragments together; by cutting them away; or by passing a seton betwixt them. The last is the most successful method of treatment.

FRACTURE OF THE OSSA NASI.

In fractures of this part, the depressed and fractured bones are to be raised up, and replaced in their natural situation, and the inflammation subdued by proper antiphlogistics. This accident is generally attended with severe contusion of the soft parts and sometimes with concussions of the brain.

FRACTURE OF THE MAXILLA INFERIOR.

The lower jaw is generally fractured between the symphysis menti and insertion of the masseter muscle. The case is easily detected by the inequality of the bone, the pain and crepitus.

The side of the bone is drawn upwards by the masseter; while the mylo-hyoidei, genio-hyoidei, genio-hyoglossi, and digastrici draw the chin downwards.

For the treatment of fracture of the lower jaw, the ends of the fragments should be placed in accurate coaptation, a pasteboard splint dipped in glue applied along the outer side of the jaw, a piece of cork of a semilunar form put between the teeth and the chin supported by a compress and bandage. During the cure the patient must live on milk panada and soups.

FRACTURE OF THE STERNUM.

The symptoms attending fracture of the sternum, are pain, crepitus, difficulty of breathing, cough, bloody expectoration, and sometimes emphysema; the soft parts are generally much contused, and in some cases the accident is succeeded by empyema or necrosis.

The method of treatment consists, when the loose splinters of bone (if there be any) are removed, in applying a bandage round the chest; bleeding the patient and administering antimonials and other antiphlogistics to prevent inflammation. Fractures of the ribs are generally attended with the same symptoms as fractures of the sternum, and require similar treatment.

FRACTURE OF THE CLAVICLE.

Fracture of the clavicle is ascertained by the pain, the inability of raising the arm, the crepitus, the shoulder of the injured side falling forwards towards the sternum, and by the ends of the fragments being distinctly felt.

The sternal portion of the clavicle generally remains in its natural situation. The acromial part is brought forwards and downwards by the weight of the arm, and by the action of the deltoides, the pectorales major and minor, the subclavius, and the serratus magnus muscles.

A fracture of this bone is to be reduced by a soft cushion being placed in the axilla, the shoulders drawn upwards, outwards and backwards, and retained in this position by means of a broad bandage. The fore-arm should be bent and supported in a sling.

FRACTURE OF THE HUMERUS.

The humerus is usually broken at its middle part. It is also sometimes fractured at its anatomical or at its surgical neck, and sometimes a little below the insertion of the deltoid muscle. The condyles of the humerus are occasionally broken off obliquely from the shaft of the bone.

The anatomical neck is a rough depression situated between the round head and tubercles of the humerus, and gives attachment to the capsular ligament; the surgical neck lies between the tubercles and the insertion of the pectoralis major, latissimus dorsi, and teres major muscles.

Fracture of the humerus is detected by the pain, crepitus, and difficulty of moving the arm; by the distortion of the limb, and the mobility of its distal or inferior part.

Fracture of the anatomical neck is to be distinguished from dislocation of the humerus by the crepitation, by the head of the humerus not being felt in the axilla, and by its remaining immovable while the surgeon rotates the diaphysis or shaft of the bone.

The greatest displacement occurs when the fracture is at the proximal or upper extremity of the bone, because it is generally oblique at this part. When the humerus is broken at the distal or inferior extremity, the fracture is commonly transverse, and on this account the displacement of the fragments is very inconsiderable.

If the humerus is broken at its anatomical neck, the lower fragment is displaced by the following muscles. The supra-spinatus, the infra-spinatus and the teres minor draw it upwards and somewhat outwards; the subscapu-

laris, the pectoralis major, latissimus dorsi and teres major draw it upwards and inwards; and the deltoides, biceps, long portion of the triceps, and the coraco-brachialis draw it directly upwards.

The inferior fragment is displaced, when fractured at the surgical neck of the humerus, by the following: the pectoralis major, latissimus dorsi and teres major draw it upwards and inwards; and the deltoides, biceps, long head of the triceps, and the coraco-brachialis draw it upwards.

In fracture of the surgical neck of the humerus, the upper fragment is drawn outwards by the supra-spinatus, the infra-spinatus and the teres minor muscles.

The inferior fragment, when broken obliquely just above the insertion of the deltoides, is displaced by the deltoides, and upwards by the biceps, coraco-brachialis and the three heads of the triceps.

The muscles which would displace the lower fragment, in case of an oblique fracture of the humerus below the insertion of the deltoid, would be the biceps, the three heads of the triceps, the coraco-brachialis and the brachialis-internus.

The method of reducing fracture of the humerus is as follows. The elbow should be bent, and the extremities of the fragments placed in coaptation by means of extension and counter-extension; two splints should then be applied to the limb, one on its radial or outer, and the other on its ulnar or inner side; these splints should extend from the shoulder to the elbow joint, and be retained in their proper situation by broad tapes; during the cure, the fore-arm should be kept in a state of flexion and suspended in a sling.

When one of the condyles of the humerus is broken

off, the fragment should be replaced, the elbow half bent, two lateral splints applied, and the fore-arm supported in a sling.

FRACTURE OF THE BONES OF THE FORE-ARM.

The bones of the fore-arm are usually fractured at the middle part and inferior extremity.

The symptoms of fracture of the bones of the fore-arm are pain, deformity of the limb, crepitus, and inability of performing pronation and supination.

The fragments are displaced in a transverse direction, that is, the radius is drawn towards the ulna, and the ulna towards the radius. The limb is seldom or never shortened. A longitudinal displacement of the fragments, however obliquely the bones may be broken, cannot, in consequence of the peculiar attachments of the muscles and interosseous ligament, take place, except it be produced by the violence which caused the fracture.

The transverse displacement is occasioned by the pronator muscles, which are the pronator radii teres, the pronator radii quadratus, the palmaris longus, the flexor carpi radialis, and the flexor digitorum sublimis.

In the treatment of fracture of the fore-arm, it must be bent, and the hand held in a position between pronation and supination; extension and counter-extension should then be made to bring the ends of the fragments into accurate contact; this being effected, two splints should be applied to the limb, one along its thenal or anterior, and the other along its anconal or posterior surface; these splints should extend from the elbow to the second

joint of the fingers; they should be well padded, to preserve the interosseous space and secured by a bandage.

The radius is most frequently fractured, and fracture of this bone is for the most part easily ascertained; the fragments are displaced in a transverse direction and drawn towards the ulna by the pronator muscles. The accident requires the same treatment as when both the bones of the fore-arm are fractured.

The ulna is generally fractured at its inferior and smaller extremity. The injury should be treated like fracture of the radius. The lower fragment is drawn towards the radius by the pronator radii quadratus muscle.

FRACTURE OF THE OLECRANON.

The olecranon is commonly fractured in a transverse direction. The symptoms of this fracture are the fore-arm being kept in a half bent position by the flexor muscles, its incapability of extension, an interspace distinctly felt between the two fragments, one of which is drawn up at the back of the humerus.

In the treatment of fracture of the olecranon, the fore-arm should be extended, the retracted olecranon brought down towards the ulna, and preserved in coaptation with it by means of a bandage. A splint should be applied along the thenal surface of the limb, to prevent flexion of the elbow joint.

FRACTURE OF THE FEMUR.

This bone is generally fractured at its middle, which is always oblique when occurring at that part or at its

upper portion; and transverse, when it takes place at its distal or inferior extremity.

The symptoms of fracture of the femur are pain, deformity and shortening of the limb, loss of motion, crepitus and eversion of the foot.

The muscles which shorten the limb when the femur is broken at its middle part, are the sartorius, the rectus femoris, the cruralis, the vasti, the tricipites longus and magnus, the gracilis, the biceps, the semitendinosus and the semimembranosus.

The turning out of the foot is produced by the action of the tricipites longus and magnus.

For reducing the fracture of the femur, the patient must be laid upon his back, and the thigh and knee fixed in a half bent position, so as to relax the muscles. Extension should then be made, and the ends of the fractured bone be brought in contact; this done, the limb should be placed upon a double inclined plane; when enveloped in a nine-tailed bandage, being wet with the lotion usually applied to the bandages surrounding fractures; the splints, when padded, should be applied, and secured by the straps, which must be tightened or slackened with the progress of the case.

The neck of the femur is commonly broken in a transverse direction. The fracture is sometimes oblique and may occur either within or without the capsular ligament.

The symptoms of fracture of the neck of the femur are the limbs being shortened and distorted; when extension is made, a crepitus is distinctly heard, the knee is bent, and the toes are turned fibulad or outwards, a swelling appears a little below the groin, the trochanter major is not observable, the patient experiences severe

pain, especially during abduction or rotation of the thigh and for the most part is incapable of standing.

The muscles which shorten the limb when the femur is broken at its crevix, are the sartorius, tensor vaginæ femoris, rectus femoris, triceps, adductor, pectinalis, gracilis, biceps, semitendinosus, semimembranosus, psoas magnus, iliacus internus, and the three glutæi muscles.

The turning out of the knees and toes is to be ascribed to the action of the muscles which rotate the thigh outwards.

The muscles which rotate the thigh fibulad or outwards, are the pyriformis, gemini, obturatores quadratus, psoas magnus, iliacus internus, glutæus minimum, and triceps; in certain circumstances these are assisted by the glutæi max. and med. and tensor vaginæ femoris.

When a fracture occurs on the outside of the capsular ligament, a bony reunion of the pieces undoubtedly takes place; but when it occurs within the capsular ligament, the fragments are never reunited by bone, but by ligamentous bands.

Fracture of the neck of the femur is to be treated in the same way as fracture of the middle part of the femur.

FRACTURE OF THE PATELLA.

This bone is generally fractured in a transverse direction. The accident is usually attended with laceration of the tendinous expansion covering the rotular or anterior surface of the patella.

The most frequent cause of transverse fracture of this bone is the action of the extensor muscles of the leg. It is sometimes produced by violent blows, &c.

The extensor muscles of the leg being the rectus, fe-

moris, the cruralis, the vastus internus and the vastus externus.

The symptoms of transverse fracture of the patella are pain and total inability of extending the leg. Between the two fragments at the same time appears a considerable interspace which is increased by flexion, but diminished by a contrary motion of the knee.

Transverse fracture of the patella is very rarely united by callous; from the difficulty of keeping the surfaces of the fragments in contact, the reunion is generally effected by ligamentous matter.

In the treatment of transverse fracture of the patella, the patient must be placed in a sitting posture, and the leg extended and laid upon a broad splint; the fragments should then be brought together and preserved in coaptation, by means of a bandage applied round the knee.

The treatment of perpendicular fracture of the patella differs very little from that of transverse fracture.

FRACTURE OF THE BONES OF THE LEG.

The symptoms which present themselves when both bones are broken at once, are loss of motion, pain, crepitus, swelling and deformity of the leg, and preternatural mobility of its lower part.

When the fracture is transverse, the lower fragments are drawn backwards by the muscles situated on the posterior aspect of the leg, so that an angular projection is formed in front of the limb.

When the fracture is oblique, the lower fragments are drawn upwards and outwards, while the upper ones project forwards and inwards. The leg is, of course shortened.

The muscles which draw the lower fragments upwards and outwards are the gastrocnemius externus, the plantaris, the soleus, the tibialis posticus, the flexor longus pollicis pedis, the flexor longus digitorum pedis, and the peronei longus and brevis.

For the reduction of fracture of the bones of the leg, the patient must be laid upon his back with his thigh somewhat raised towards the abdomen, and his knee half bent. Extension and counter-extension should then be made, and as soon as the ends of the fragments are placed in coaptation, the limb should be carefully laid upon the double inclined plane of the fracture apparatus, carefully surrounded with padding, and kept damp with the lotion for a few days.

When the tibia or fibula is broken alone, neither case is attended with any shortening of the leg, and with only a very slight displacement of the fragments, and all that is required is rest and the application of a long splint to that side of the leg on which the fracture is situated. When the accident is complicated with luxation of the ancle joint, the treatment, of course, is less simple.

DISEASES OF THE JOINTS.

The joints may be affected with inflammation, dropsy, white swelling, morbus coxarius, anchylosis, and loose cartilages forming in them. Joints are also subject to wounds, sprains and dislocations.

INFLAMMATION OF THE JOINTS.

The symptoms indicative of an inflamed joint are pain, swelling, redness and increased heat, accompanied with inflammatory fever, more or less violent.

Inflammation existing in a joint is to be subdued by copious and repeated bleedings by means of leeches and cupping, conjoined, when the inflammation is moderate, with cold saturnine lotions; when severe, with warm fomentations and emollient poultices. The general remedies are purgatives, antimonials and mild diluents.

DROPSY OF THE JOINTS.

Hydrops articuli is a collection of fluid in the capsular ligament of a joint and is characterized by the appearance of a soft indolent fluctuating tumour, over the site of a large articulation; the superincumbent integuments are not at all inflamed, and the skin generally retains its natural color; the affected joint feels weak, though its motions are but little impeded; the tumour is unattended with pain.

The joints most subject to this disease are the knee, wrist, ancle and shoulder.

This collection is generally produced by an inflamed or irritated state of the synovial membrane, hence so frequently a sequent of injuries inflicted on the joint or of rheumatism.

In the cure our object is to produce an absorption of the fluid, which may generally be accomplished by gradual pressure applied by strappings of plaster and bandages, or the use of iodine, or mercury, electricity or

friction; the irritation from a blister is often beneficial, particularly at the commencement.

WHITE SWELLING.

When a joint is attacked with this affection there is a dull heavy pain, though at first not by any means acute; the swelling is firm, and elastic; the skin is not inflamed nor does it undergo any change of color; as the complaint advances, the joint becomes more and more inflexible, and from the bulk of the other parts of the limb diminishing, appears considerably enlarged; the pain at length increases, the skin ulcerates at several points and a scrophulous matter is discharged through the openings; hectic symptoms then supervene, and if the disease be not removed by amputation, the patient soon dies.

Now under this general term white swelling there are four forms of disease included.

1. The preceding symptoms may be occasioned by an inflamed state of the synovial membrane lining the capsular ligament.

2. By a morbid change in the structure of the symnovial membrane, its becoming considerably thickened, sometimes to the extent of half an inch, soft, elastic and changed in color; the pain accompanying this affection is not so considerable as affecting the former, until the ulceration attacks the cartilages. The bones often ultimately become caries, while the soft parts suppurate.

Children are generally the subjects of this, and is limited with but few exceptions to the knee.

3. Ulceration of the cartilaginous extremities of the bones, is frequently a sequent of some diseased action

of the adjoining parts, though it may occur as a primary affection, being preceded by some slight inflammation. The extremities of the bones may thus be completely stripped of their cartileges, and then follows caries of their structure, the cure of which at least must end in anchylosis.

The swelling has not that elastic and puffy feeling which attends inflammation of the synovial membrane; as the ulceration advances the pain becomes more severe — it is frequently present some time before the swelling.

4. The swelling may proceed from scrophula and in this case the action is commenced in the bones and the ulceration of the cartilages secondarily.

There are three stages of this form. 1. That in which the affection is confined to the bone. 2. Where the external parts become thickened and swelled. 3. The suppurative stage, attended with ulceration of the cartilages, inflammation of the synovial membrane and abscesses.

The morbid joint in the course of time becomes considerably enlarged, and from the distention of the skin it acquires a shining appearance — curdy like mat ter is discharged and by ulceration communicates with the cavity of the joint.

We are led to discriminate this form of the disease by the constitution in which it occurs, and its being attended with less pain, the degree of swelling being considerable, and its tardiness towards suppuration.

The treatment in this disease must be regulated by its either being in the acute or chronic state; when in the former it must be checked if possible at the onset, by the prompt application of measures best adapted to that pur-

pose, as the frequent abstraction of blood, local soothing applications either as refrigerants or otherwise.

If the chronic stage is present as a sequent, or if ulceration of the cartilage is the primary affection, a discharge should be kept up externally, by means of seatons, issues or blisters, as long as symptoms of ulceration continues, together with a strict observance of a state of rest to the limb.

When there is a subsidence of pain, friction may be employed to recover the tone of the joint, together with the use of iodine or strappings of plaster passed round the joint to excite absorption.

The diet should be nutritious, tonic medicines, either steel or bark are generally required.

If the extent of the disease be considerable the constitution will sympathise so materially that if not mitigated in time, or the limb removed, it will soon carry off the patient.

DISEASED HIP-JOINT.

From the frequency with which this disease occurs, and the importance of its being fully understood, claims for it a separate description, though the causes from which it originates, as also its progress, deviates but slightly from the white swelling occurring in the other joints.

It generally appears in youth, though no ages are exempt. A debilitated state of the constitution, as after an attack of fever, may favor its occurrence, or an injury of the joint, the exposure of the hips to damp or cold, which causes a strumous habit, may render more susceptible of its propagation.

At the commencement of this disease, the patient complains of a sense of uneasiness in the knee and hip, and acquires a sort of limping in his walk; the whole affected limb feels weak, and after a short time becomes emaciated, and is noticed to be lengthened.

In the further progress of the complaint, a severe pain arises behind the trochanter major, extending down to the knee, ankle, and foot; the patient, at the same time, is restless and feverish, the nates becomes flattened, particularly that part which is usually most prominent, the crista of the ilium is depressed, and the spine distorted.

The position of the limbs, in either being turned inwards or outwards, lengthened or shortened, will be affected by the progress of the case.

The system is more or less affected, according to the acuteness of the disease, the accompanying fever frequently assuming the hectic form, and too often terminating but in the dissolution of the patient.

This disease is ushered in by a slight inflammation of some part of the structures forming the joint, by which their character is more or less changed.

The ulcerative process in the cartilages soon follows, generally commencing with those of the acetabulum, then destroying the covering of the head of the os femoris, the ligamentum teres and the capsule of the joint, finally attacking the bones themselves by caries.

Pus is frequently formed in the progress of the disease, sometimes at an early period; depending upon the acuteness of the inflammatory action, as evinced by additional pain and tension of the neighboring parts, and lengthening of the limb.

The matter, after having ulcerated through the capsular ligament, presents itself as a tumour, generally over

the vastus externus muscle, and sometimes after burrowing among the muscles, occasions abscesses in several places.

The head of the bone by the destruction of the ligament and articular cartilages, is much changed in situation and sometimes completely dislocated from the acetabulum, upwards and backwards on the dorsum of the ilium; the limb becoming permanently shortened, and the patient soon either destroyed by constitutional irritation, or recovers with an anchylosed joint.

To prevent this train of evils, and for the favorable termination of a case, it is of the greatest importance that the presence of the disease should be early ascertained, and measures taken to arrest its progress; though it is to be regretted, there is so great a want of attention to, and knowledge of this disease, which from its insidious character, frequently makes considerable progress before the practitioner is aware of its existence.

As soon as the character of the case is ascertained, it is absolutely necessary that the patient should be limited to the horizontal position, that the joint may be kept in an entirely passive state.

There should be repeated local abstraction of blood, either by cupping or leeches, behind the trochanter major, the use of fomentations to the hip frequently; or the patient carefully placed in a warm bath if there be much inflammation, and the patient not likely to be too far debilitated by it.

The regimen should be antiphlogistic if the inflammation be of an acute character.

The local abstraction of blood is called for at the commencement of most cases, either under ulceration or otherwise, but the frequency of its repetition must be

regulated by the presence of pain and state of the pulse. The chief evil to fear is the formation of pus, which when the inflammation is considerable, is a frequent result, and is attended with so much constitutional disturbance as to leave but slight chance for the patient's recovery.

When the inflammation is chronic, it is advisable occasionally to substitute issues, caustics, and blisters, or the use of the moxa for the cupping and leeches.

LOOSE CARTILAGES IN THE JOINTS.

These are round bodies about the size of a bean, of a cartilaginous nature, occasionally formed within the capsular ligaments, to which that of the knee is susceptible. They are perfectly movable, slipping about in the synovial membrane, from one part of the articulating surface to the other, and sometimes from their situation give great pain in the movement of the joint.

These are generally the sequents of inflammation of the synovial membrane, by its vessels discharging into the cavity of the joint, a quantity of coagulable lymph; which soon becomes organized and eventually converted into a cartilaginous substance.

The only sure mode of ridding the patient of the inconvenience arising from these bodies is to extract them by making a small opening on one side of the joint; though the exigency of the case is seldom such as to warrant the step. Compression by means of a laced capor bandage will frequently disperse these bodies if commenced early.

ANCHYLOSIS.

This is an adhesion of the articular surfaces of the bones, producing partial or complete immobility of the joint.

Anchylosis is divided into two kinds; the complete and incomplete. Anchylosis is termed complete when it is produced by the extremities of the bones becoming united by ossific matter, and incomplete when it depends upon a contracted state of the ligaments and muscles.

Anchylosis arises from fractures and violent contusions of the joints, from swelling, morbus coxarius, &c. When it occurs during the existence of the latter affection, it must be regarded as a desirable event.

The complete kind is irremediable. The incomplete may be cured by frequent, but gentle motion of the joint, by friction, &c.

DISLOCATIONS.

Surgeons have divided dislocations into simple and compound; complete and incomplete; primitive and consecutive.

The detection and successfal treatment of these accidents is often a criterion of an adequate surgical and anatomical knowledge. But far too often are there cases to be witnessed, as stubborn, lasting memorials of a want of this requisite knowledge, for which there is indeed cause to blush.

The symptoms indicative of luxation are pain, swelling, and deformity of the joint, loss of motion, and an alteration in the shape, length, motion and direction of the limb.

For the reductions of dislocations, the patient being placed in a suitable position, and secured by proper contrivances, the practitioner should relax those muscles of the limb which appear most likely to offer any impediment to the reduction; extension should then be made in the direction of the displaced bone, so as to dislodge it from the situation in which it has been thrown; in proportion as it approaches the articular cavity whence it had escaped it should be brought back to its natural position, and incline to such a point as will most effectually allow the over stretched muscles to recover their action, whereby it may be drawn into its proper place.

When the extending force cannot dislodge the head of the luxated bone in consequence of the great strength and resistance of the muscles, the patient should be bled to syncope, put into a warm bath, or have a nauseating dose of tartrat antimonii given him.

In compound dislocations the luxated bone should be replaced in its articular cavity by the method just described, the wound should then be closed with adhesive plaster and healed if possible by the first intention; proper measures must at the same time be adopted to subdue the attendant inflammation. If the bone cannot be reduced by extension, the wound must be dilated; and if after enlargement of the wound the reduction cannot still be accomplished the head of the bone must be sawed off.

DISLOCATION OF THE LOWER JAW.

The symptoms of this are violent pain, inability to shut the mouth, and difficulty of swallowing and articulation. The lower jaw projects beyond the upper one; the cheeks and temples are flattened; a depression is perceived before the external meatus auditorius, and the saliva flows from the mouth in prodigious quantities.

The lower jaw may be dislocated forwards, in which case the condyles pass over the eminentiæ articulares, and lodge beneath the zygomatic arches; the coronoid processes at the same time come in contact with the malar bones.

The capsular ligaments are sometimes ruptured, but in general they remain entire; the lateral ligaments are never ruptured.

The method of reducing luxation of the lower jaw is this: the surgeon having covered his thumbs with thick leather, should place them as far back as possible between the molar teeth, and grasp the side of the jaw with his fingers; he should then press the bone downwards, and at the same time raise up the chin; this manœuvre brings the muscles into action, and the condyles are forcibly drawn into the articular cavities.

When both condyles are dislocated, it is better to replace first one and then the other, than to reduce both at once.

DISLOCATION OF THE CLAVICLE.

The sternal extremity of the clavicle is the most frequently luxated; which luxation may be forwards, upwards,

or backwards. The first kind is the most frequent. Luxation downwards is prevented by the position of the cartilages of the ribs.

The luxation forwards is produced by the shoulder being forcibly driven back. The accident is denoted by pain and the appearance of a tumour at the top of the sternum.

The ligaments that are ruptured in the dislocation forwards of the sternal extremity of the clavicle, are the radiated, capsular, and interclavicular ligaments; and the ligamentum rhomboideum.

The surgeon should draw the shoulders upwards, backwards, and outwards; push the dislocated end of the bone into its proper cavity and apply over it a firm compress. He should then place a small cushion under the axilla, confine the shoulder back by a bandage, bend the forearm, and suspend it in a sling.

Luxation of the acromial extremity of this bone is produced by falls, or blows violently depressing the shoulder, the injury is easily detected by a swelling at the top of the shoulder, by the pain in moving the arm, and by the inclination of the head to the affected side.

The ligaments ruptured in luxation of the acromial end of the clavicle are the ligamentum conoideum, the ligamentum trapezoideum, and the capsular.

To reduce the luxation the shoulder should be pulled upwards and outwards, a cushion placed in the axilla, the luxated extremity of the bone pressed down and retained in its natural situation by a bandage, the shoulders should be braced back, the elbow fixed to the side and the forearm bent and supported in a sling.

DISLOCATION OF THE HUMERUS.

This bone may be dislocated in four directions, downwards into the axilla; inwards into the fossa subscapularis; outwards into the fossa infra-spinata; and upwards behind the clavicle. Luxation downwards occurs most frequently; luxation upwards is always consecutive; and luxation inwards is sometimes primitive, sometimes consecutive.

The symptoms which attend dislocation downwards, are pain, and inability to raise the arm. The head of the humerus is felt in the axilla, the limb is lengthened, the fore-arm extended, and a depression is perceptible below the acromion of the scapula.

The head of the bone in luxation downwards, lodges at the inferior costa of the scapula, between the subscapularis muscle and the long head of the triceps extensor cubiti.

The parts ruptured in luxation downwards, are the capsular ligaments, and tendon of the subscapularis muscle, and the tendons of the supra-spinatus and infra-spinatus sometimes.

The tendon of the long head of the biceps is sometimes broken, sometimes torn from the bicipital groove; generally, however, it is merely overstretched. The muscles in a state of tension in luxation downwards, are the deltoides, the coraco-brachialis, the biceps, the long head of the triceps, the supra-spinatus, the infra-spinatus, the teres minor, and the pectoralis major.

The head of the humerus in consecutive luxation inwards, which sometimes succeeds dislocation downwards, is situated in the fossa subscapularis, beneath the subscapularis muscle, and is covered by the subscapularis, the

pectoralis minor, the coraco-brachialis, the short head of the biceps, the pectoralis major, and the deltoides.

The manner in which luxation of the humerus downwards is to be reduced, is by the patient being seated in a chair, and then a broad towel put round the chest, under the axilla of the injured side, and another fixed to the humerus, just above the condyle; the fore-arm should then be bent to relax the biceps, and the humerus raised to an obtuse angle with the trunk of the body, to relax the supra-spinatus, and infra-spinatus; extension should now be made directly outwards; as soon as the head of the humerus has arrived at the edge of the glenoid cavity, the arm should be brought downwards and forwards towards the abdomen, and the extension discontinued, when the muscles draw back the bone into its natural situation.

For the reduction of consecutive luxation inwards, the patient, when seated, and the arm and fore-arm held as in dislocation downward, extension should be made in the direction of the displaced humerus to bring its head back into the axilla; this beingaccomplished, the surgeon must finish the reduction according to the method recommended in dislocation downwards.

The symptoms of primitive luxation inwards are the patient's experiencing very violent pain when the arm is brought forwards; the head of the humerus is felt under the pectoral muscle; the elbow is inclined backwards, and the length of the limb somewhat increased.

The head of the humerus in primitive luxation inwards, is lodged in the fossa subscapularis, and is covered by the same muscles as in consecutive luxation inwards.

The parts ruptured in primitive luxation inwards are the capsular ligament; and the tendons of the supra-spinatus and infra-spinatus muscles are sometimes torn from the humerus. The muscles in a state of tension, are the

subscapularis, the supra-spinatus, the infra-spinatus, the teres minor, and the posterior part of the deltoides. The biceps, the long head of the triceps, the coraco-brachialis, the teres major, and the latissimus dorsi muscles, are also somewhat stretched.

In primitive luxation inwards the patient when seated and the limb fixed as in dislocation downwards, extension should be made outwards and backwards; immediately the head of the humerus is brought within the capsular ligament, the limb should be inclined forwards towards the chest and somewhat upwards, when the muscles draw back the bone into the glenoid cavity.

The symptoms indicative of dislocation outwards, are severe pain and difficulty of moving the arm. The head of the humerus is felt beneath the infra-spinatus and teres minor muscles and the limb is lengthened, separated from the side and inclined forwards.

The head of the humerus in luxation outwards is situated in the fossa infra-spinata, and is covered by the posterior part of the deltoid, by the infra-spinatus and teres minor muscles.

The capsular ligament, and subscapularis muscle are lacerated, and sometimes the supra-spinatus is torn from its connexion with the humerus in this dislocation.

The anterior part of the deltoides, the pectoralis major, the subscapularis, and the supra-spinatus, are much overstretched. The biceps, coraco-brachialis, long head of triceps, the teres major and latissimus dorsii, are slightly elongated.

To reduce the outward dislocation the patient being seated, and the limb placed as in dislocation downwards, extension should be made outwards, and somewhat forwards; as soon as the head of the humerus is brought to

the edge of the glenoid cavity, the limb should be carried backwards, and drawn down towards the side, when the bone slips into its natural situation.

In consecutive luxation upwards the head of the humerus is lodged at the root of the coracoid process of the scapula, behind the clavicle, between the serratus magnus and subscapularis, the former muscle being on its mesial or inner, and the latter on its outer side; and it is covered by the pectoralis minor, the coraco-brachialis, the short head of the biceps, the pectoralis major and the deltoides.

The reduction is to be accomplished when the patient is placed as in the above; by the limb being moved about in various positions to disentangle the humerus from its new situation; at the same time extension should be made in the direction of the displaced bone so that its head may again be brought into the axilla; this done, the reduction must be completed according to the plan recommended in luxation downwards.

The primitive luxation of the humerus upwards is prevented by the acromion and corocoid processes, the anterior triangular ligament of the scapula, the conoid and trapezoid ligaments, the capsular ligament, the long head of the biceps, the subscapularis, the supra-spinatus, and the coraco-brachialis muscles. The deltoides, the infra-spinatus, the teres minor, the teres major and latissimus dorsi, also in some degree assist in preventing luxation upwards.

DISLOCATION OF THE RADIUS AND ULNA FROM THE HUMERUS.

The bones of the fore arm may be dislocated in four different ways — anconad or backwards; thenad or forwards; radiad or outwards; and ulnad or inwards. — Luxation backwards is the most common case.

The symptoms of luxation backwards are the joint being extremely deformed, painful and swollen, and its motions impeded; the hand is in a state of constant pronation; the olecranon is lengthened; and the fore-arm is half bent and incapable of extension.

The anconeus, the pronator radii teres, the spinator radii brevis, the brachialis internus, the biceps flexor cubiti, the triceps extensor, and the flexores digitorum sublimis and profundus; the flexor carpi radialis, the flexor carpi ulnaris, and the flexor longus pollicis, are also somewhat stretched.

The parts ruptured in luxation backwards are the capsular and lateral ligaments, and the anconeus muscle. The annular ligament, the brachialis internus, the pronator radii teres, and the supinator radii brevis muscles are likewise sometimes lacerated.

For the reduction of a dislocation backwards the patient being seated, an assistant must lay hold of the humerus at its middle part, while another grasps the forearm, at its inferior extremity; extension in the direction of the radius and ulna and counter extension should be made, during which the surgeon pushes the olecranon downwards and forwards into its natural cavity.

Dislocation forwards cannot occur without a fracture of the olecranon, which is retracted and felt projecting

at the back of the humerus; the elbow is bent backwards and the coronoid process of the ulna forms a prominence on the thenal or anterior aspect of the lower extremity of the humerus. In the treatment of luxation forwards, extension should be made backwards in the direction of the fore-arm, so that the sigmoid cavity of the ulna may be replaced in its natural situation, that is, on the trochlea or larger articular surface of the humerus; this done the fore-arm should be quite extended, the olecranon brought down to, and placed in coaptation with the ulna, and the same measures adopted as in fracture of the olecranon.

In luxation radiad or outwards the sigmoid cavity of the ulna occupies the small articular surface of the humerus from which the head of the radius is completely thrown off. The case is detected by the pain, inability of performing flexion and extension of the fore-arm, the projection of the radius and internal condyle of the humerus at the opposite sides of the arm, the prone position of the hand, the half bent state of the elbow, and the flexion of the fingers.

The capsular and lateral ligaments are always ruptured, and generally the annular ligament of the radius. In the treatment of luxation outwards, the articulating surfaces of the bones being disengaged by means of extension and counter extension, the surgeon should grasp the elbow and push the bones into their proper places.

In luxation inwards, the ulna is pushed off from the trochlea of the humerus and the radius occupies its place. The accident is characterized by pain and swelling of the elbow joint, loss of motion, the half bent state of the fore-arm, and the projection of the ulna at the inner, and of the external condyle of the humerus at outer side of the limb. The muscles overstretched are the brachialis

internus, the biceps, the triceps, the supinator radii brevis, the anconeus, the supinator radii longus, and most of the extensor muscles of the hand, fingers and thumb. Luxation inwards is to be treated by the same method as luxation outwards.

DISLOCATION OF THE FEMUR.

The femur at the hip may be dislocated in four different ways, viz. upwards and backwards on the dorsum of the ilium; downwards and inwards into the foramen thyroideum; upwards and forwards on the os pubis; and backwards into the sacro-sciatic notch.

The capsular and round ligaments are both lacerated in luxation of the femur at the hip, in whatever direction the bone may be displaced. The latter, however, sometimes remains entire in dislocation downwards and inwards.

The symptoms indicative of luxation upwards and backwards are the joint being swollen, painful and immovable; the limb is shortened and incapable of being rotated outwards; the foot is inverted; the trochanter major turned forwards, and situated near the superior anterior spinous process of the ilium; the thigh is bent on the pelvis; the knee is inclined forward; the hip is flattened; and a tumour is felt under the glutæi muscles.

The luxation upwards and backwards is to be distinguished from fracture of the neck of the thigh bone, by the foot being turned outwards in fracture and the trochanter major backwards; the limb is rotated without difficulty, though the motion is attended with considerable pain; it is also easily lengthened by extension, during which, a crepitus is always very perceptible.

The muscles in a state of tension in this luxation are the obturator internus and externus, the gemini, the quadratus femoris, the psoas magnus, the iliacus internus, the pectinalis, the tricipites brevis and longus, and in some degree the triceps magnus.

The mode of reducing luxations upwards and backwards is this. The patient must be laid on the opposite side, with his knee bent, and his pelvis securely fixed; extension should then be made across the opposite thigh a little above the knee; when the head of the femur is brought on a level with the acetabulum, the limb should be rotated outwards, and the extending force discontinued, when the muscles bring the bone into its proper situation.

In luxation downwards and inwards into the foramen thyroideum, the head of the femur is felt at the upper and inner part of the thigh, the limb is considerably lengthened and inclined somewhat forwards. The knee is bent and separated a great distance from the opposite one and is with great difficulty brought in contact with it; the buttocks appear flattened and the toes are generally turned outwards.

The muscles overstretched are, the tensor vaginæ femoris, the sartorius, the rectus femoris, the pectinalis, the triceps, the gracilis, the psoas magnus, the iliacus internus, the glutæi, the pyriformis, the biceps, the semitendinosus, the semimembranosus.

The method of reducing luxation downwards and inwards is this. The pelvis being fixed and the knee bent, the limb should be extended downwards and outwards; as soon as the head of the bone is drawn from its situation the knee should be carried across the opposite one, and the limb rotated inwards; the surgeon at the same

time drawing the upper part of the femur outwards away from the thyroid hole.

The symptoms of luxation upwards and forwards, are the limb being shortened and drawn slightly backwards, the toes are turned outwards, and the head of the thigh bone is distinctly felt in the groin above Poupart's ligament.

The head of the femur in luxation upwards and forwards, lodges on the ascending ramus of the os pubis at the lateral or outer side of the femoral vessels and is covered by the iliacus internus and psoas magnus muscles.

The muscles in a state of tension in luxation upwards, are the three glutæi, the pyriformis, the quadratus, the gemini, the obturatores internus and externus.

Luxation upwards and forwards, is to be reduced, by having the pelvis fixed, and the knee bent, an assistant extend the limb downwards and backwards, the surgeon then passing a towel under the upper part of the thigh, raises the head of the bone up, and carries it over the os pubis and margin of the acetabulum.

The symptoms which attend luxation backwards, are the head of the femur being felt behind the acetabulum, the length of the limb being somewhat diminished, the motion of rotation greatly impeded, the knee bent and inclined forwards, and the feet turned inwards or tibiad.

Luxation upwards and backwards is to be reduced by fixing the pelvis, then bending the knee, the limb should be extended downwards and forwards, across the opposite one; during which the surgeon should lift the head of the bone over the margin of the acetabulum, by means of a napkin passed round the upper part of the thigh.

DISLOCATION OF THE PATELLA.

The patella may be dislocated in two ways, tibiad or inwards, fibulad or outward. Luxation outwards is of the most frequent occurrence.

The symptoms of luxation of the patella, are the knees being extended and incapable of being bent, a depression is felt in front, and a hard tumour on the outer side of the joint. The accident is to be remedied by fully extending the leg, pushing the patella into its natural situation, and applying a bandage loosely around the knee.

DISLOCATION OF THE FOOT.

The foot may be dislocated in four directions, inwards, outwards, forwards and backwards. Luxation inwards is the most common case.

In luxation inwards, the fibula is fractured, the malleolus is broken off, the capsular deltoid and transverse ligaments are ruptured and the peroneus longus and the brevis muscles overstretched.

In luxation outwards, the malleolus internus is broken off from the tibia, the fibula is fractured, the capsular and external ligaments are lacerated, and the tibialis anticus, the tibialis posticus, the flexor longus digitorum, and flexor longus pollicis muscles overstretched.

The treatment is this, the patient being laid on his back, with his thigh and knee bent, extension should be made in the axis of his leg; the bones should then be pushed into their natural situation, and a splint, reaching beyond the ankle and knee joint, applied to each side of the leg and secured by bandages. The limb should then be placed on a double inclined plane.